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2024 MEADE ST.
DENVER, COLORADO

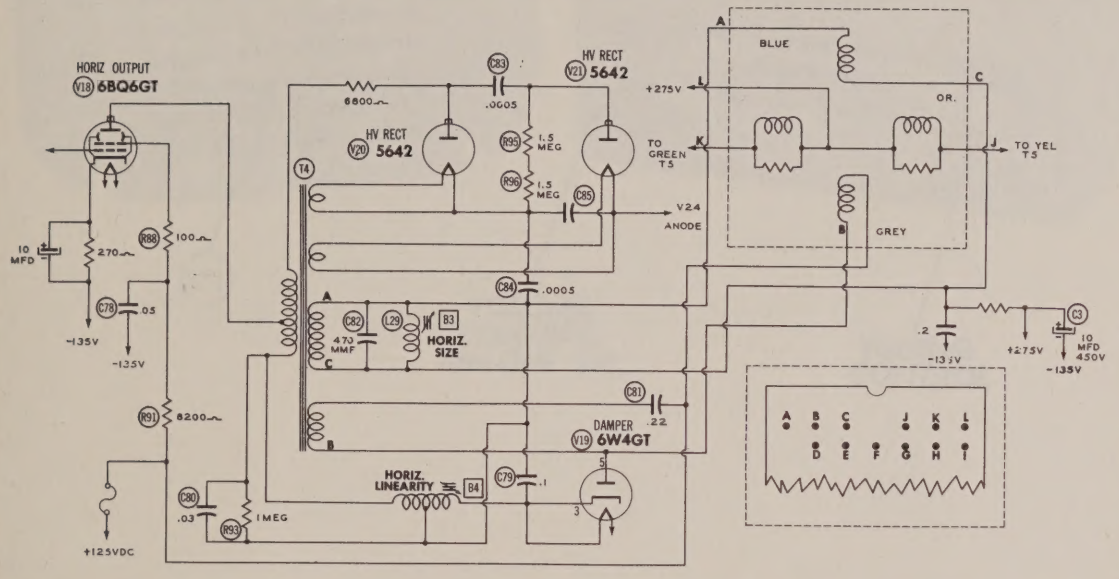
SUPPLEMENTAL DATA FOR FOLDER 16 IN SET #128

Code C03

Sylvania Model 1210X , Chassis 1-381, Code C03 have the V13 and V17 tubes changed from 12AU7 to 6SN7GT.

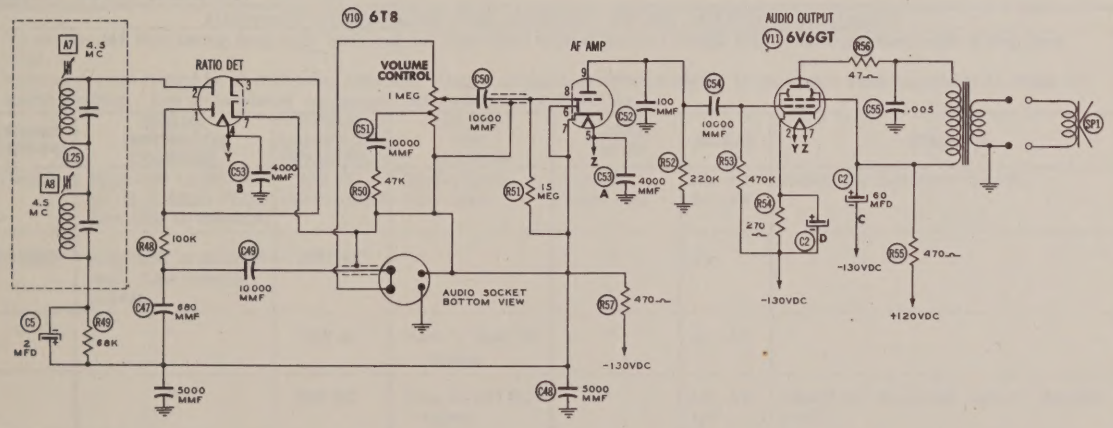
Code C04

All Model 1210X, Chassis 1-381, Code C04 have the Horizontal Scan Circuit changed. The horizontal output transformer (T4) was changed to Part #241-0005 and the horizontal vertical deflection coil (T6) was changed to Part #100-0006. A partial schematic below shows the new horizontal output circuit.



Code C05

Model 1210X, Chassis 1-381, Code C05 have the Ratio Det., 1st. AF, and AF Output changed to eliminate 4.5MC Harmonic Interference as shown in the partial schematic below.



SYLVANIA MODEL 1210X CHASSIS 1-381.

PRODUCTION CHANGES
BULLETIN 44

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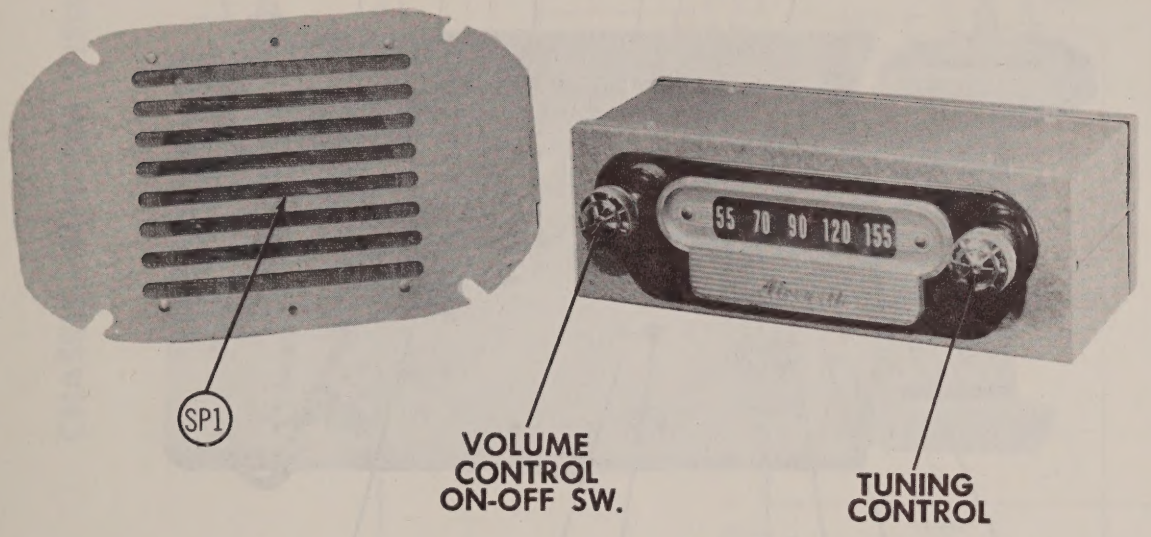
AIRCASTLE
MODEL 610.H400



AIRCASTLE
MODEL 610.H400

TRADE NAME	Aircastle Model 610.H400 (For 1949 thru 1951 Hudson Automobiles)
MANUFACTURER	Spiegel, Inc., 1061 W. 35th. St., Chicago 9, Ill.
TYPE SET	Battery Operated Custom Built Automobile Superheterodyne Receiver
TUBES (Six)	Types 6BA6 RF Amp., 6BE6 Conv., 6BA6 IF Amp., 6AT6 Det.-AVC-AF Amp., 6AQ5 Audio Output, 6X4 Rectifier
POWER SUPPLY	6 Volt Storage Battery — RATING 5.4 Amp. @ 6.3 Volts DC
TUNING RANGE—BROADCAST	538 - 1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer turn tuning gang fully open and set right hand edge of pointer saddle 1/4" from right hand edge of dial back plate.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 6BE6 (V2). Low side to chassis.	455 KC (400 ∿ Mod.)	Tuning gang fully open	Across Voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	100MMF	High side to antenna lead. Low side to chassis.	1600 KC	"	"	A5	"
3.	"	"	1400 KC	Tune in 1400 KC signal	"	A6, A7	"
4.	"	"	600 KC	Tune in 600 KC signal	"	A8, A9 A10	Adjust for maximum output. Repeat step 3.

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		AIRCASTLE PART No.	STANDARD REPLACEMENT		
V1	RF Amplifier	6BA6	6BA6	7BK	
V2	Converter	6BE6	6BE6	7CH	
V3	IF Amplifier	6BA6	6BA6	7BK	
V4	Det.-AVC-AF Amp.	6AT6	6AT6	7BT	
V5	Audio Output	6AQ5	6AQ5	7BZ	
V6	Rectifier	6X4	6X4	5BS	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRCASTLE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	■20	350	CE-86	AFH3-107		UP2235C		FP345.8	TVL-3678	
B	▲20	350								
C	20	25								
C2	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.02	400		P488-02	DF-203	PTE4S2		PT412	4TM-S2	Note 1
C4	.02	400		P488-02	DF-203	PTE4S2		PT412	4TM-S2	Note 1
C5	100		CC200	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	Note 2
C7	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	Note 3
C8	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	Note 2
C9	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C10	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C11	.008	1600	C205			PTE16D8		PT1628	MB-D8	
C12	.5	100	C209	P185-5		MP2P5			68P20	
C13	.5	100	C209	P185-5		MP2P5			68P20	

Note 1. Some models use .05MFD in this application (Part #C207)
Note 2. Some models use 200MMF in this application (Part #CC201)
Note 3. Some models use .002MFD in this application (Part #C203)

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRCASTLE PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	750KΩ	½	RV-100	Q13-137	AG-79-Z	B-70-S	U-51	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATTS	AIRCASTLE PART No.	IRC PART No.	
R2	330Ω	½	R303	BTS-330	
R3	1.2Meg	½		BTS-1.2 Meg.	Note 1
R4	22KΩ	½	R314	BTS-22K	
R5	1500Ω	½	RV-100	BTS-1500	
R6	2Meg	½	R310		
R7	22KΩ	2	R311	BTB-22K	

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATTS	PART No.	IRC PART No.	
R8	10Meg	½	R313	BTS-10Meg	
R9	270KΩ	½	R307	BTS-270K	
R10	500KΩ	½	R301		
R11	330Ω	½	R301	BTS-330	
R12	1000Ω	1	R312	BTA-1000	
R13	68Ω	½			Note 2
R14	68Ω	½			Note 2

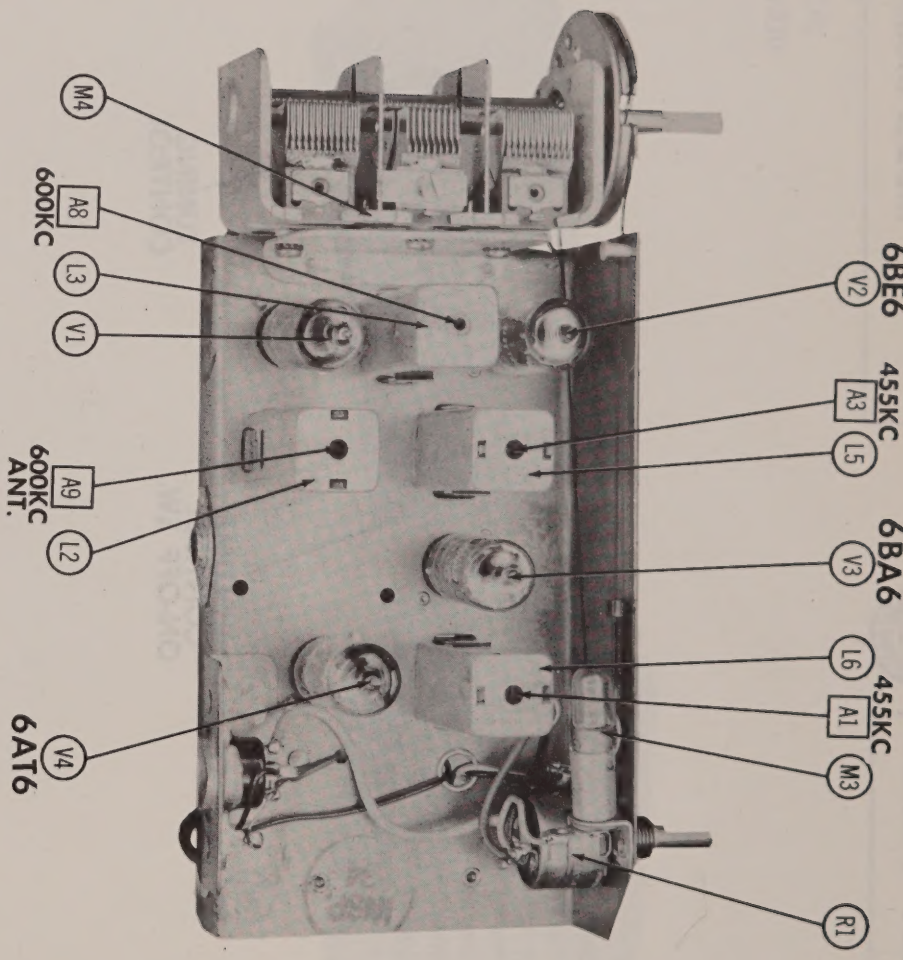
Note 1. Some models use a 1Meg resistor in this application.
Note 2. Some models use a 100Ω resistor in this application.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	6V. ② 3A	430VCT .046ADC			TV-100		P-2971	VT-1 ①	V-16K

① Drill new mtg. holes

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AIRCASTLE PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4KΩ	3Ω	280Ω	.5Ω	Part of Spkr.	A-3877	A-2930	RO-8	S-3X	

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	AIRCASTLE PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5"	PM	3Ω	PM250	ST-105 Mod. P5-X	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AIRCASTLE PART No.	MERIT PART No.	
L1	Ant. Hash Choke	1Ω		L200		Wound on Capacitor
L2	Ant. Coil	13.5Ω	4.8Ω	57FB-3		
L3	RF Coil	110Ω	8Ω	57FB-4		
L4	Osc. Coil	8.3Ω		L201		Tap @ .8Ω
L5	Input IF	18Ω	18Ω	1655-16	BC-352	
L6	Output IF	18Ω	18Ω	1655-16	BC-353	
L7	Fil. Choke	0Ω		L203		
L8	Hash Choke	.1Ω		L202		

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA				NOTES
				AIRCASTLE PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	
M1	Interrupter	6.3	115	V-94	5301	M-859	5301	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AIRCASTLE PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	15A 32V.	A201	A300	311015	155020	AGC 15	HDJ-B

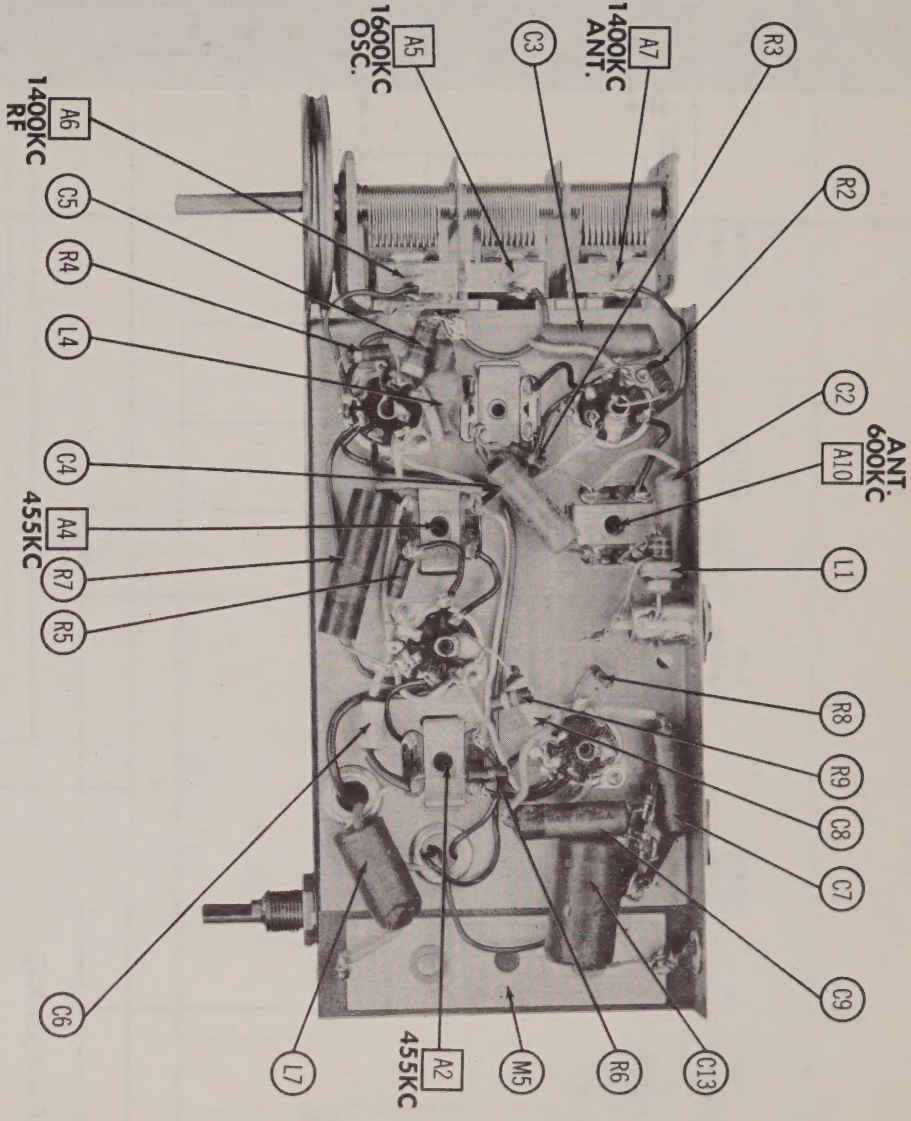
DIAL LIGHTS

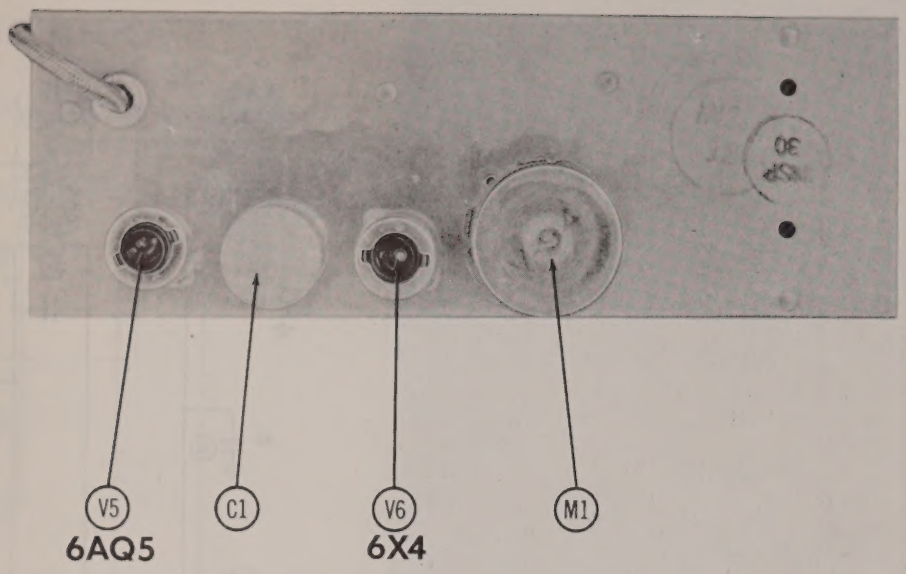
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					AIRCASTLE PART No.		
M3	Bayonet	6-8	.15	Brown	T47		Type #47

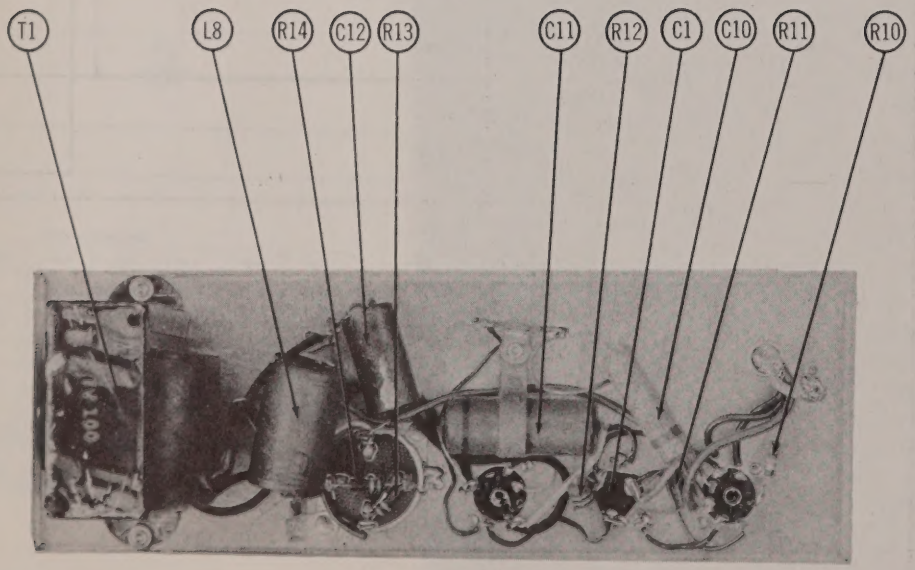
MISCELLANEOUS

ITEM No.	PART NAME	AIRCASTLE PART No.	NOTES
M4	3 Gang Var. Cap.	CV-100	(23-391MMF, 24-387MMF, 35-198MMF)
M5	Spark Plate		
	Dial Scale	H401	
	Dial Pointer	PS100	
	Knob	H310	

CHASSIS—BOTTOM VIEW




V5
C1
V6
M1
6AQ5
6X4


T1
L8
R14
C12
R13
C11
R12
C1
C10
R11
R10

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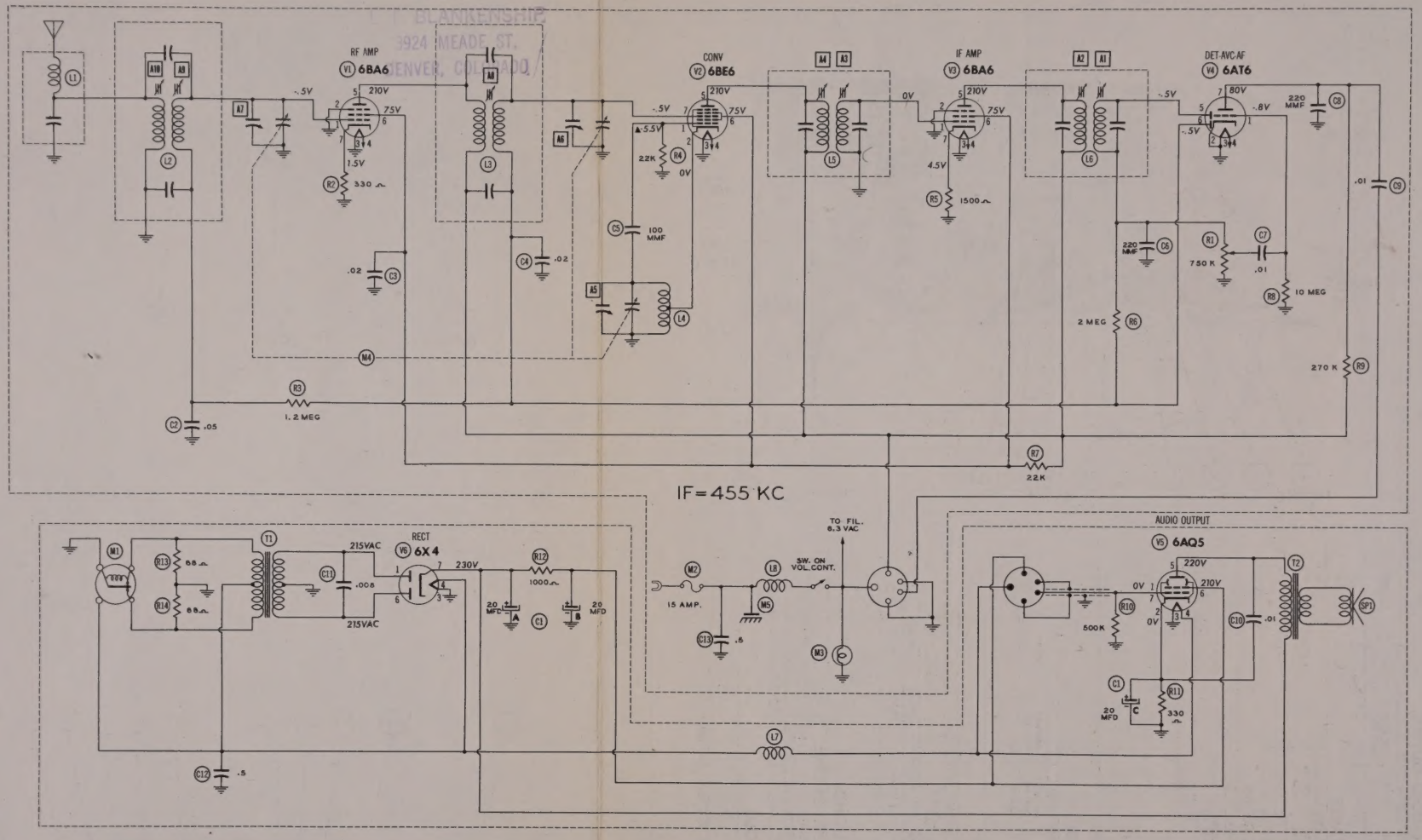


1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom wiews.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

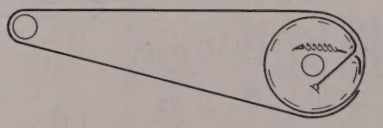
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	6BA6	3.9Meg	0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	330Ω
V 2	6BE6	22KΩ	.8Ω	0Ω	.4Ω	†1KΩ	†21KΩ	2.7Meg
V 3	6BA6	1MΩ	0Ω	0Ω	.4Ω	†1KΩ	†21KΩ	1.5KΩ
V 4	6AT6	10Meg	0Ω	0Ω	.4Ω	†50KΩ	2.7Meg	†270KΩ
V 5	6AQ5	500KΩ	330Ω	0Ω	.4Ω	†280Ω	†1KΩ	500KΩ
V 6	6X4	250Ω	INF	0Ω	.4Ω	INF	280Ω	55KΩ

† MEASURED FROM PIN 7 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

TUNING GANG FULLY CLOSED



DIAL CORD DRIVE

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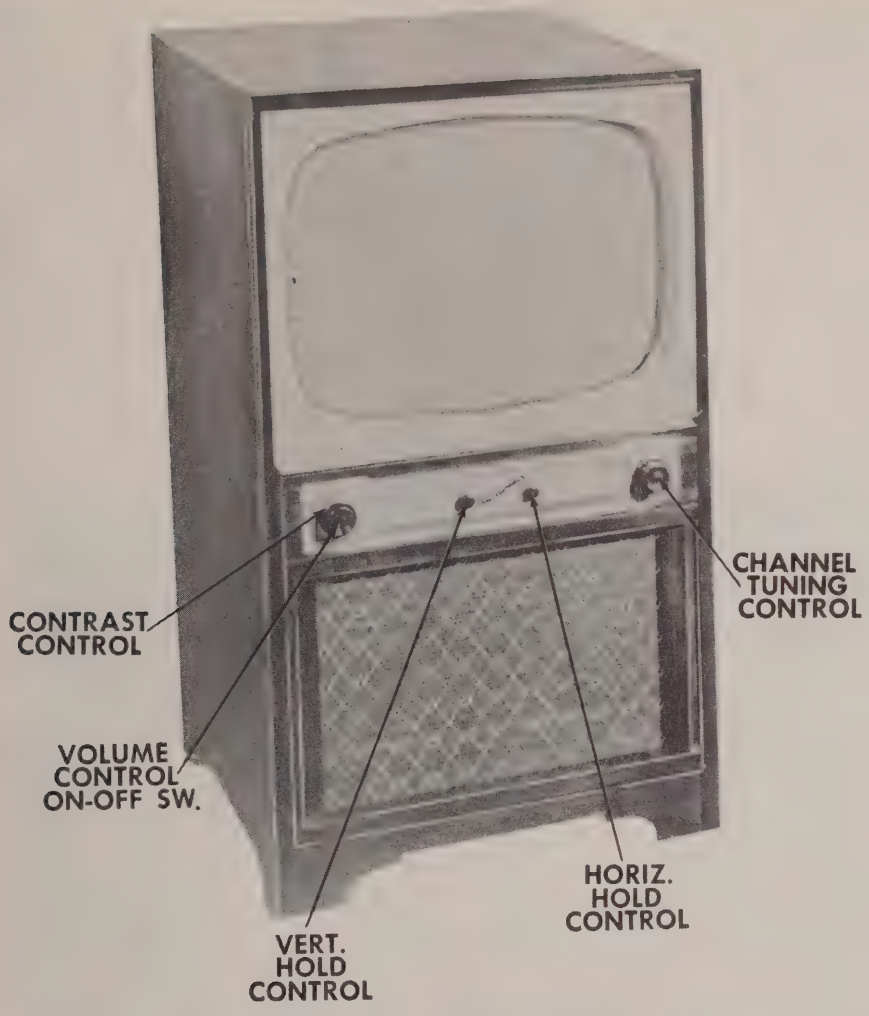

AMBASSADOR
MODELS 20PC, 20PCS, 20PCS2

TRADE NAME	Ambassador Models 20PC, 20PCS, 20PCS2
SUPPLIER	Allied Pur. Corp., 401 5th. Ave., New York, 16, N.Y.
TYPE SET	Television Receiver
TUBES	Nineteen

POWER SUPPLY - 110-120 Volts AC-60 Cycle RATING 1.68 Amp. @ 117 Volts AC
TUNING RANGE–CHANNELS 2 thru 13 (continuous tuning)

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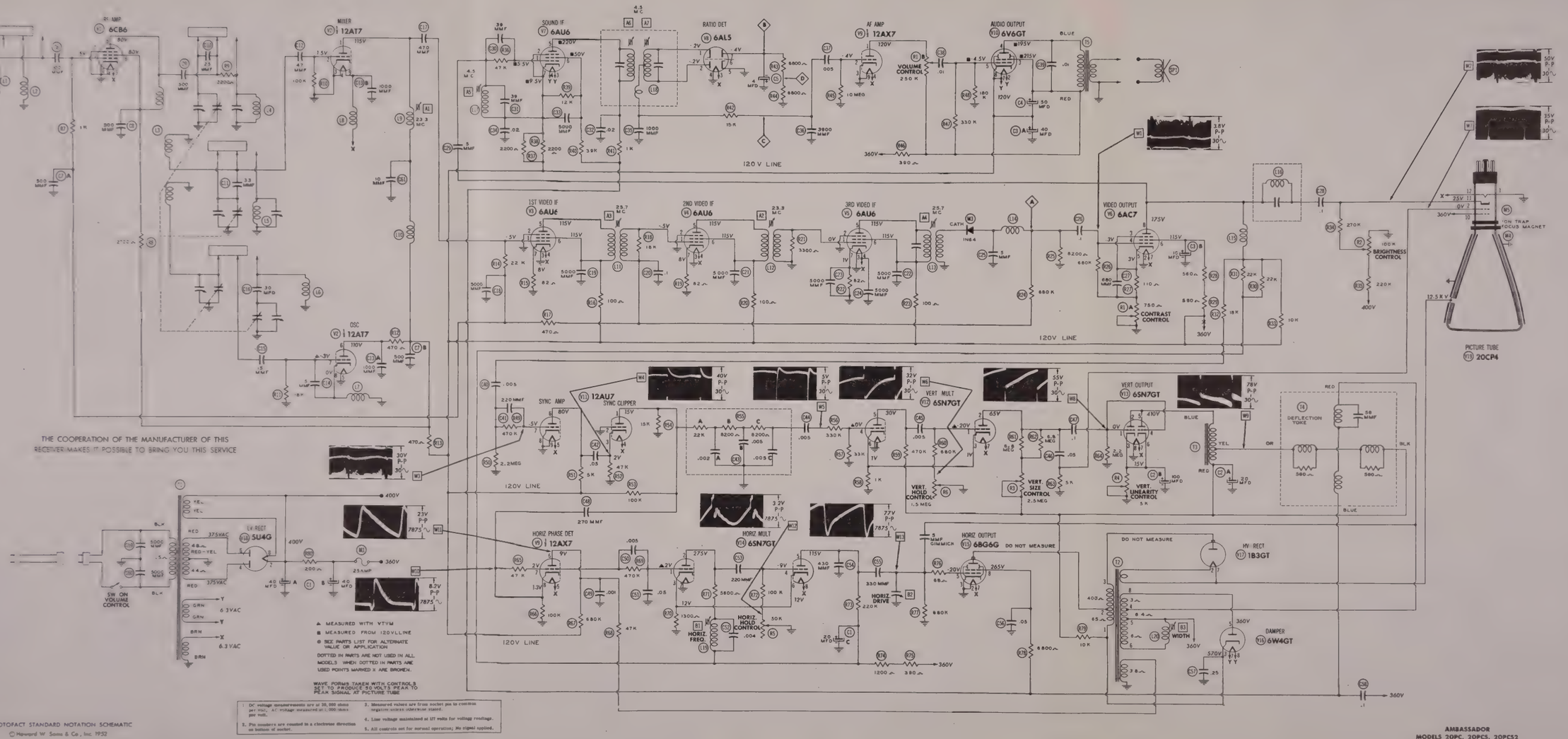
RF AMP V1 6CB6
MIXER V2 12AT7
OSC V2 12AT7
SOUND IF V7 6AU6
RATIO DET V8 6AL5
AF AMP V9 12AX7
AUDIO OUTPUT V10 6V6GT
VOLUME CONTROL 250 K
1ST VIDEO IF V3 6AU6
2ND VIDEO IF V4 6AU6
3RD VIDEO IF V5 6AU6
1N64
VIDEO OUTPUT V6 6AC7
CONTRAST CONTROL
BRIGHTNESS CONTROL
ION TRAP FOCUS MAGNET
PICTURE TUBE V19 20CP4
SYNC AMP V11 12AU7
SYNC CLIPPER
VERT MULT V12 6SN7GT
VERT. HOLD CONTROL 1.5 MEG
VERT. SIZE CONTROL 2.5 MEG
VERT OUTPUT V13 6SN7GT
VERT. LINEARITY CONTROL 5 K
DEFLECTION YOKE
HORIZ PHASE DET V5 12AX7
HORIZ MULT V14 6SN7GT
HORIZ. FREQ.
HORIZ. HOLD CONTROL
HORIZ. DRIVE 220 K
HORIZ OUTPUT V15 6BG6G
DO NOT MEASURE
HV RECT V17 1B3GT
WIDTH
DAMPER V16 6W4GT
LV. RECT V18 5U4G
SW. ON VOLUME CONTROL
120 V LINE
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
▲ MEASURED WITH VTVM
■ MEASURED FROM 120 V LINE
● SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN.
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 80 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE
1. DC voltage measurements are at 20,000 ohms per volt, AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless otherwise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.
A PHOTOFACT STANDARD NOTATION SCHEMATIC
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AMBASSADOR
MODELS 20PC, 20PCS, 20PCS2

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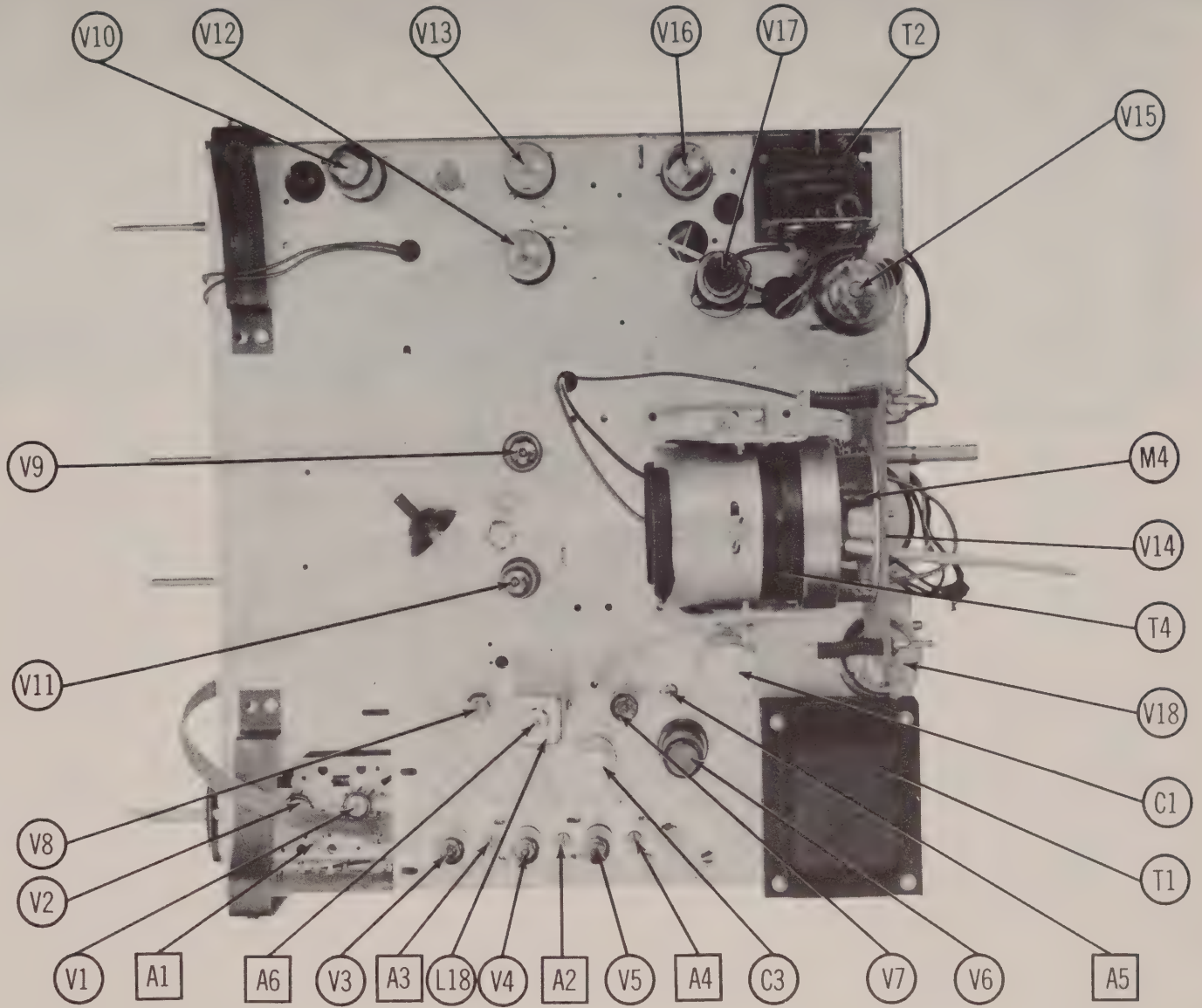
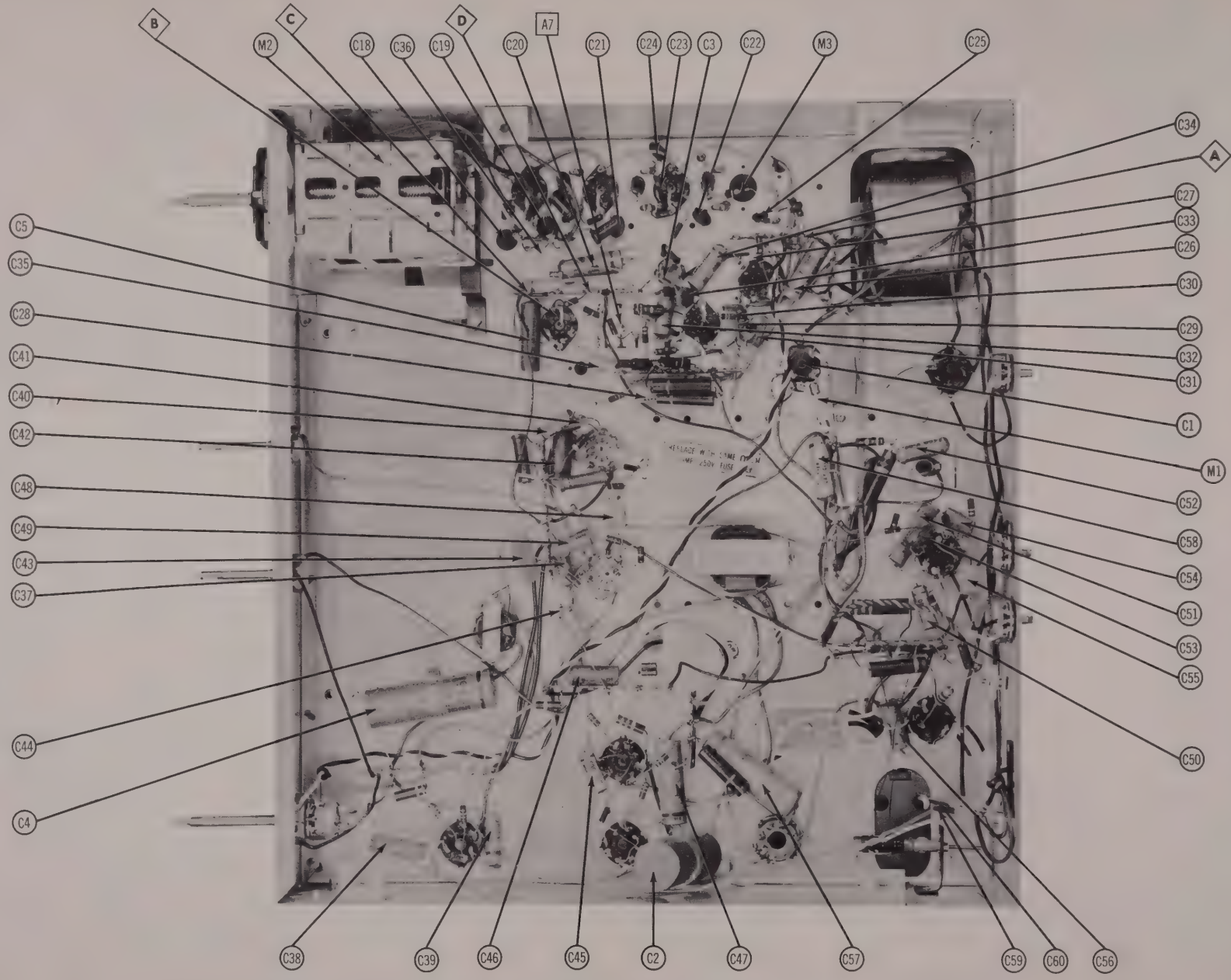
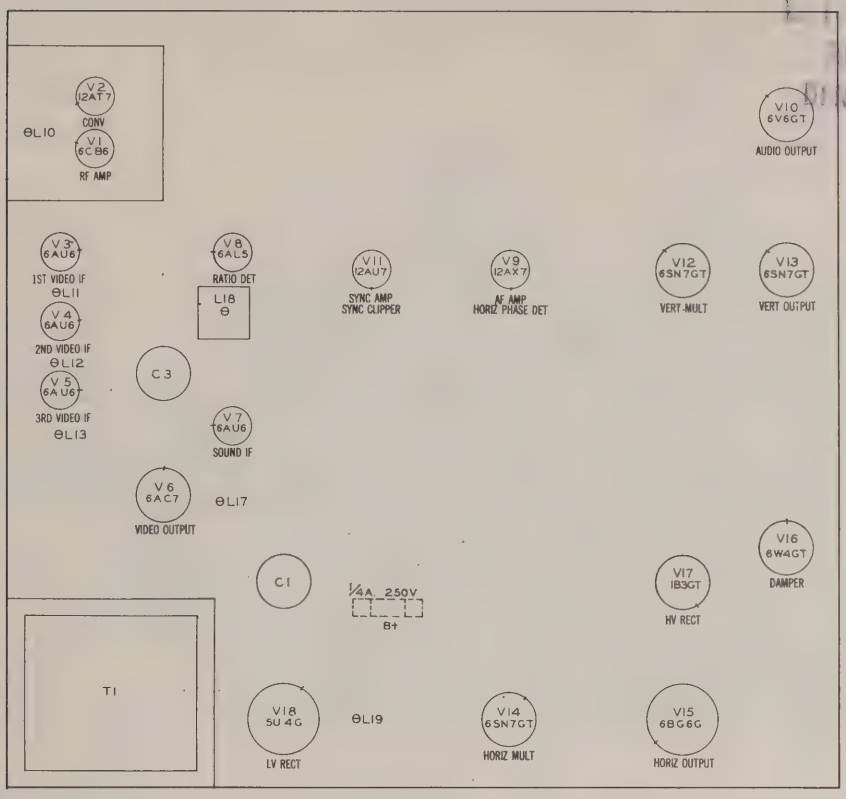


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - V18

LOSS OF PICTURE OR SOUND
No pic, No sound, Has raster - V2, V3, V4, V5, V6, V10
No pic, No sound, Has snow - V1, V2, V3
No pic, Has sound, Has raster - V6, V19
Has pic, No sound - V7, V8, V9, V10

SYNC FAILURE
No Vert. sync - V11, V12, V13
No Hor. sync - V11, V9, V14
No Vert. or Hor. sync - V11

SWEEP FAILURE
No raster, Has sound - V14, V15, V16, V17, V19, Fuse (M1)
No Vertical deflection - V12, V13
Poor Vert. Linearity or foldover - V12, V13
Poor Horiz. linearity or foldover - V14, V15, V16
Narrow picture - V14, V15, V16, V18
Vert. off freq. - V12
Horiz. off freq. - V9, V14

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt battery to the ungrounded side of C20. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	23.3MC (unmod.)	Any not used locally.	DC probe to Point (A). Common to chassis.	A1, A2	Adjust for maximum deflection.
2	"	"	25.7MC	"	"	A3, A4	"

OVERALL VIDEO IF RESPONSE CHECK

In order to prevent an erroneous indication of the response curve the fine tuning control should be turned to a point of non-interference. This will be a point where a slight rotation of the control produces no change in the shape of the response curve. Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	.001MFD	High side to pin 2 (grid) of 12AT7 (V2). Low side to chassis.	24MC (10MC swp.)	21.6MC 26.1MC	Tune to point of non-interference.	Vert. amp. to Point (A). Low side to chassis.		Check for response curve similar to fig. 1 with video marker at 50% and sound marker at 5% of response. If necessary retouch A1 thru A4 for proper response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
4.	.001MFD	High side to Point (A). Low side to chassis.	4.5MC (unmod.)	Any not used locally	DC probe to Point (B). common to chassis.	A5, A6	Adjust for maximum deflection.
5.	"	"	"	"	DC probe to Point (C). Common to Point (D).	A7	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
4.	.001MFD	High side to Point (A). Low side to chassis.	4.5MC 450KC swp.	4.5MC	Any not used locally.	Vert. amp. to Point (B). Low side to chassis.	A5, A6	Disconnect stabilizer capacitor C5. Adjust for maximum amplitude and symmetry as per fig. 2.
5.	"	"	"	"	"	Vert. amp. to Point (C). Low side to chassis.	A7	Reconnect capacitor C5. Adjust so 4.5MC appears at center of crossover lines as in fig. 3. SLIGHTLY retouch A6 for maximum amplitude and straightness of crossover lines.

The tuner has been properly aligned at the factory and is very stable. Alignment of tuner should not be required in the field.

FIG. 1

FIG. 2

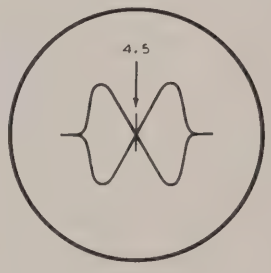
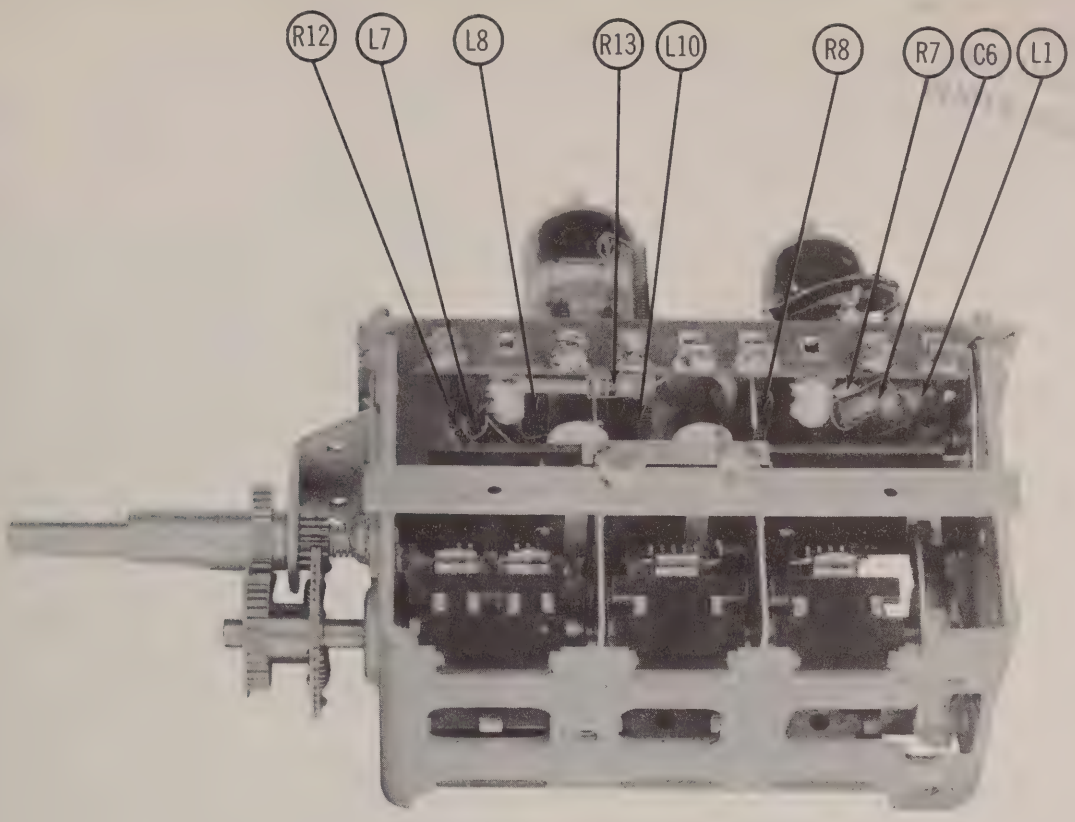
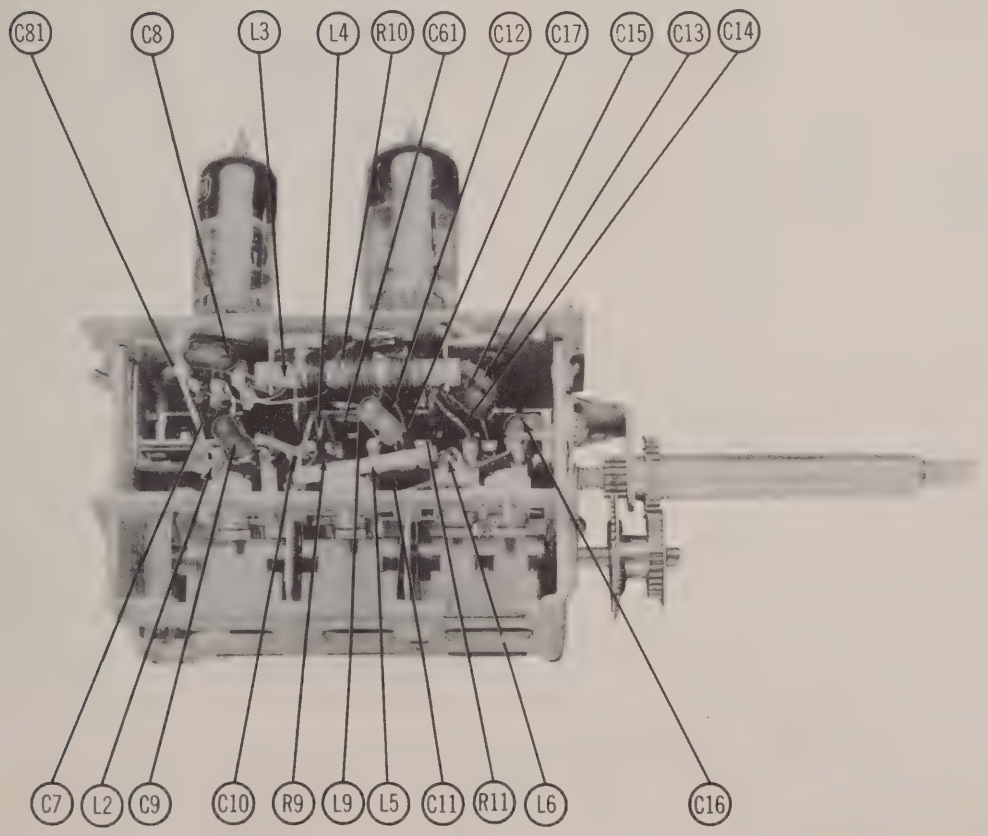


FIG. 3



RF TUNER-RIGHT SIDE



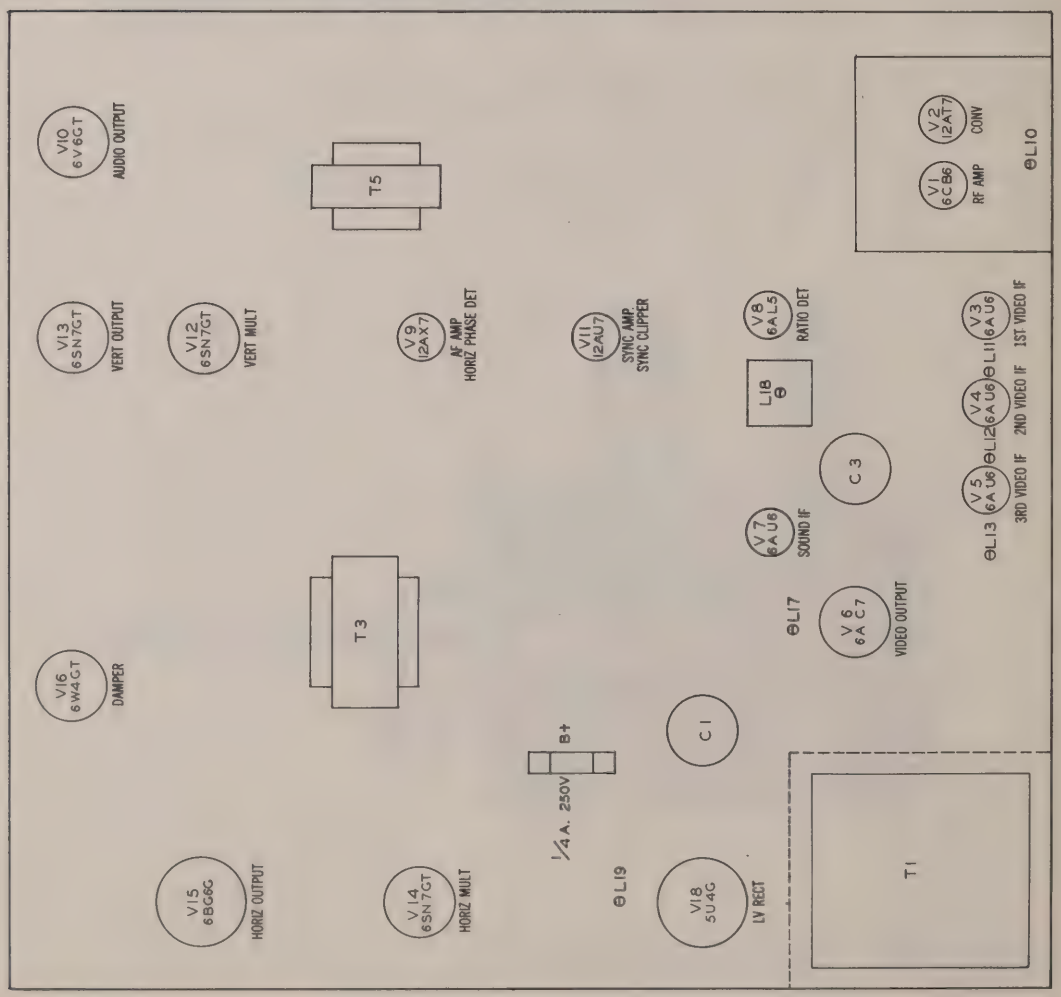
RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

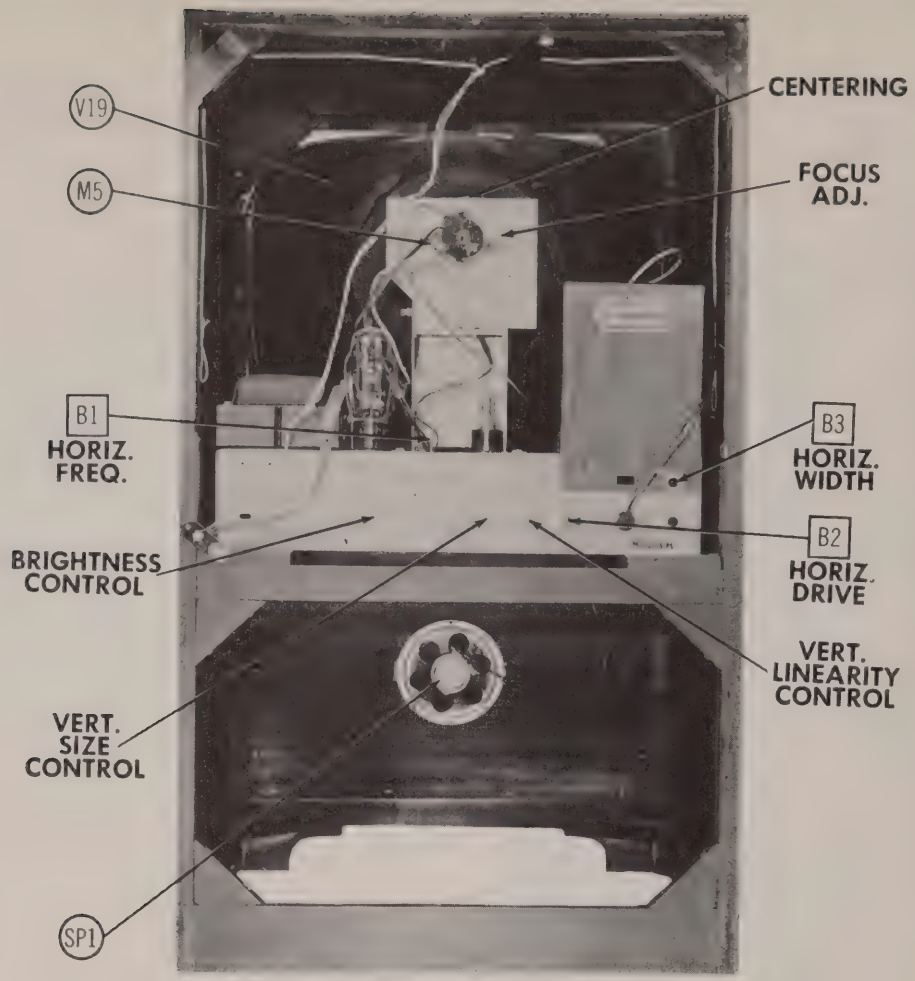
VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6CB6	690KΩ	0Ω	.2Ω	0Ω	■3.1KΩ	■3.1KΩ	0Ω		
V 2	12AT7	■470Ω	100KΩ	0Ω	0Ω	0Ω	■940Ω	18KΩ	.2Ω	.2Ω
V 3	6AU6	710KΩ	0Ω	0Ω	.1Ω	■100Ω	■100Ω	82Ω		
V 4	6AU6	680KΩ	0Ω	0Ω	.1Ω	■100Ω	■100Ω	82Ω		
V 5	6AU6	.1Ω	0Ω	0Ω	.1Ω	■100Ω	■100Ω	82Ω		
V 6	6AC7	0Ω	0Ω	225Ω	680KΩ	225Ω	■1.3KΩ	.1Ω	†9KΩ	
V 7	6AU6	■48KΩ	■1.1KΩ	■0Ω	■.1Ω	†1.3KΩ	■10KΩ	■1.1KΩ		
V 8	6AL5	INF	INF	.1Ω	0Ω	0Ω	INF	13KΩ		
V 9	12AX7	†250KΩ	10Meg	0Ω	.1Ω	.1Ω	47KΩ	150KΩ	100KΩ	0Ω
V 10	6V6GT	INF	■.1Ω	†925Ω	†590Ω	130KΩ	INF	■0Ω	40KΩ	
V 11	12AU7	15KΩ	0Ω	47KΩ	.1Ω	.1Ω	■5KΩ	2.7Meg	0Ω	0Ω
V 12	6SN7GT	2Meg	#4Meg	1KΩ	33KΩ	#480KΩ	1KΩ	.1Ω	0Ω	
V 13	6SN7GT	.2.2Meg	#11KΩ	1KΩ	2.2Meg	#11KΩ	1KΩ	.1Ω	0Ω	
V 14	6SN7GT	615KΩ	†7.4KΩ	1.3KΩ	120KΩ	†220KΩ	1.3KΩ	0Ω	.1Ω	
V 15	6BG6G	INF	0Ω	0Ω	INF	680KΩ	INF	.1Ω	†7KΩ	TOP CAP #65Ω
V 16	6W4GT	INF	INF	200KΩ	INF	†213Ω	INF	■.1Ω	■0Ω	
V 17	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP #465Ω
V 18	5U4G	INF	50KΩ	INF	44Ω	INF	48Ω	INF	50KΩ	
V 19	20CP4	0Ω	5KΩ	PIN 10 †200Ω	PIN 11 310KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 2 OF V18
# MEASURED FROM PIN 3 OF V16
■ MEASURED FROM 120VDC LINE



TUBE PLACEMENT CHART



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control in the center of its range and adjust the horizontal frequency slug, (B1) for horizontal synchronization.

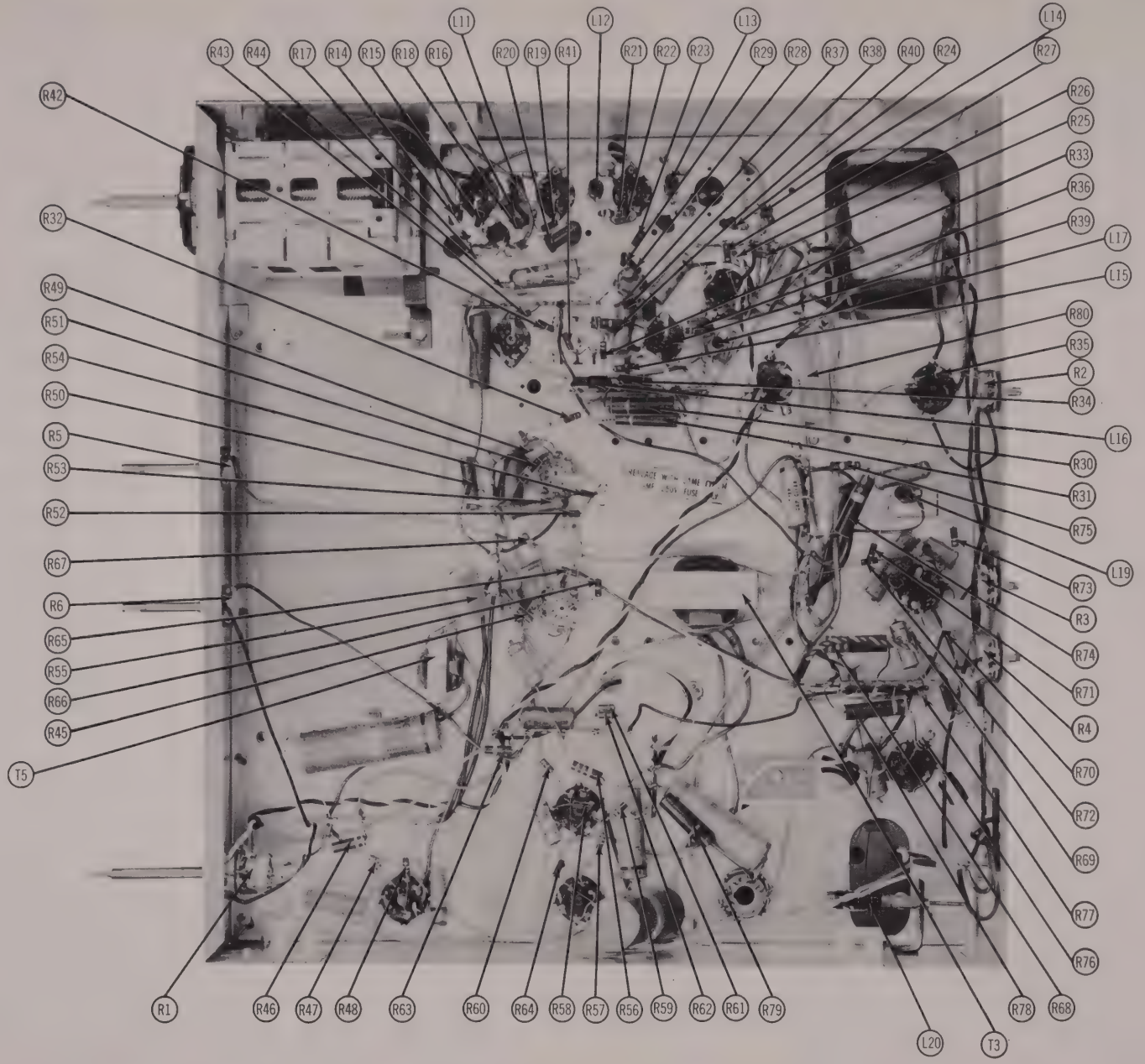
Adjust the horizontal drive trimmer, (B2) counter-clockwise to the point where a vertical white line appears in the picture, then clockwise until the line just disappears.

Adjust the width slug (B3) for a picture slightly wider than enough to fill the picture mask.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built-in antenna and speaker.
4. Remove 2 wood screws. Remove antenna bracket.
5. Remove 2 nuts holding speaker. Remove speaker.
6. Remove 1 wood screw. Remove CRT brace from top of cabinet.
7. Remove 4 chassis bolts. Remove chassis.

NOTE: FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AMBASSADOR PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6CB6	6CB6	7CM	
V2	Converter	12AT7	12AT7	9A	
V3	1st. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp.	6AU6	6AU6	7BK	
V6	Video Output	6AC7	6AC7	8N	
V7	Sound IF Amp.	6AU6	6AU6	7BK	
V8	Ratio Detector	6AL5	6AL5	6BT	
V9	AF Amplifier - Horiz. Phase Det.	12AX7	12AX7	9A	
V10	Audio Output	6V6GT	6V6GT	7AC	
V11	Sync. Amplifier - Sync. Clipper	12AU7	12AU7	9A	
V12	Vert. Mult.	6SN7GT	6SN7GT	8BD	
V13	Vert. Output	6SN7GT	6SN7GT	8BD	
V14	Horiz. Mult	6SN7GT	6SN7GT	8BD	
V15	Horiz. Output	6BG6G	6BG6G	5BT	
V16	Damper	6W4GT	6W4GT	4CG	
V17	HV Rectifier	1B3GT	1B3GT	3C	
V18	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: AMBASSADOR PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V19	20CP4	20CP4	12D	① Circuit changes necessary
		20CP4A ①	12D	② 3/8" longer
		20DP4 ②	12D	
		20DP4A ① ②	12D	
		20HP4 ① ②	12C	
		20HP4A ① ②	12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AMBASSADOR PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450		AFH3-44		UPT44445		FP447	TVL-3787	
B	■40	450								
C	▲20	450								
C2A	20	450		PRS450/20		BR2045A		TC75	TVA-1709	Red
B	100	25		PRS25/100		BRH25IA		TC3501	TVA-1207	Yellow
C3A	■40	350		AFH3-38		UP22135		FP146	TVL-1725	
B	▲10	250						TC52	TVA-1504	
C4	50	350		PRS450/40		BR4035		TC78	TVA-1713	
C5	4	50		PRS150/4		BR550		TC30	TVA-1303	
C6	100			S1100	D6-101	TM5T1	GP1K-101	UC-5311	5GA-T1	
C7A	500			S1500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
B	500			S1500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C8	500			S1500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C9	500			S1500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C10	25			S125	D6-250		GP1K-250	UC-5425	5GA-Q25	
C11	33				TCN-33		N750K-330	UC-5433	5TCU-Q33	
C12	47			S147N750	TCN-47		N750K-470	NT-5447	5TCU-Q47	
C13A	1000			BPD-2X001	DD-2-102	TM5DD1	812-001	DCD-521	5HK-2D1	
B	1000									
C14	5			S15N750			N750K-050	NT-555		
C15	15				TCN-15		N750K-150		5TCU-Q15	
C16	30				TCN-30		N750K-300			
C17	470			S1470	D6-471		GP2K-471	UC-5347	5GA-T47	
C18	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C19	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C20	.1	200		P288-1	DF-104	PT2P1		PT401	2TM-P1	
C21	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C22	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	5			S15	TCZ-4.7	5W5V5	GP1K-050	ZT-555	MS-55	
C26	.1	200		P288-1	DF-104	PT2P1		PT401	2TM-P1	
C27	680			S1680	D6-681	2RST7	GP2K-681	UC-5368	5GA-T68	
C28	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C29	5			S15	TCZ-4.7	5W5V5	GP1K-050	ZT-555	MS-55	
C30	39	500		1468-00004	D6-390	5W5Q4	GP1K-390	MC223	1FM-44	
C31	39	500		1469-00004		5R5Q4		MCB223	MS-44	
C32	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C33	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	.02	400		P488-02	DF-203	PTE4S2		PT412	4TM- S2	
C35	1000			S11000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C36	3900			1464-004		1DR5D4		MC463		
C37	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C38	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C39	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C40	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C41	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C42	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C43A	.002			P688-002		PTE6D2	GP2-333-202	PT622		
B	.005		♦	P688-005	♦PC-100	PTE6D5	GP2-333-502	PT625	♦101C1	
C	.005			P688-005		PTE6D5	GP2-333-502	PT625		
C44	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C45	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C46	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C47	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C48	270	500		1469-0003	D6-270	5RST3	GP2K-271	MCB241	MS-33	
C49	.001	400		P488-001	D6-102	PTE4L1	GP2L-102	PT621	6TM-D1	
C50	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C51	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AMBASSADOR PART No. ♦	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C54	430	500								
C55	330	500		1469-00035						
C56	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C57	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C58	.1	200		P288-1	DF-104	PT2P1		PT401	2TM-P1	
C59	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C60	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	

♦ Items C43A, C43B, C43C, R55A, R55B, R55C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Ambassador PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	½	VC-12127S	QJ-246*	RTV-397	SBBT-8828	WF13-T251	Contrast-Tapped ② 500Ω-Panel
B	250KΩ	½					UR254A	Volume-Rear
C	Switch						US-26	Attach to R1B
R2A	100KΩ	½	VCA-12135	QH-128	AG-49-8	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	2.5Meg	½	VC-12121C	QH-239	AG-84-8	AB-83	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	5000Ω	½	VC-12120B	QH-114	AG-19-8	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	50KΩ	½	VC-12131C	QH-123	AG-44-8	AB-35	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R5A
R6A	1.5Meg	½	VC-12132C	QH-138	AG-83-8	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R6A

*CONCENTRIKIT EQUIVALENT -KIT K-2, BASE ELEMENTS& SHAFTS B17-105X & P1-210 (Panel), B13-130 & R2-226 (Rear) & Switch 76-1.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AMBASSADOR PART No.	IRC PART No.	IDENTIFICATION CODES: ALL RESISTORS ± 10% UNLESS OTHERWISE NOTED
R7	1000Ω	½		BTS-1000	RF Amp. Grid
R8	2700Ω	½		BTS-2700	RF Amp. Decoupling
R9	2200Ω	½			Parasitic Suppressor
R10	100KΩ	½			Mixer Grid
R11	18KΩ	½			Osc. Grid
R12	470Ω	½		BTS-470	Osc. Plate
R13	470Ω	½		BTS-470	Decoupling
R14	22KΩ	½			1st. Video IF Amp. Grid
R15	82Ω	½ 20%		BTS-82	1st. Video IF Amp. Cathode
R16	100Ω	½		BTS-100	1st. Video IF Amp. Decoupling
R17	470Ω	½		BTS-470	AGC Network
R18	18KΩ	½			2nd. Video IF Coil Shunt
R19	82Ω	½ 20%		BTS-82	2nd. Video IF Amp. Cathode
R20	100Ω	½		BTS-100	2nd. Video IF Amp. Decoupling
R21	3300Ω	½		BTS-3300	3rd. Video IF Coil Shunt
R22	82Ω	½ 20%		BTS-82	3rd. Video IF Amp. Cathode
R23	100Ω	½ 20%		BTS-100	3rd. Video IF Amp. Decoupling
R24	680KΩ	½ 20%		BTS-680K	AGC Network
R25	8200Ω	½		BTS-8200	Video Det. Load
R26	680KΩ	½ 20%		BTS-680K	Video Output Grid
R27	110Ω	½ 5%		BTS-110 5%	Video Output Cathode
R28	560Ω	½ 20%		BTS-560	Video Output Screen
R29	560Ω	½ 20%		BTS-560	Video Output Screen
R30	22KΩ	½ 20%	2	BTB-22K	Video Output Plate
R31	22KΩ	½ 20%	2	BTB-22K	Video Output Plate
R32	18KΩ	½		BTS-18K	Isolation
R33	10KΩ	½		BTS-10K	Voltage Divider
R34	270KΩ	½ 20%	1	BTA-270K	Picture Tube Cathode
R35	220KΩ	½ 20%		BTS-220K	Voltage Divider
R36	47KΩ	½			Sound IF Amp. Grid
R37	2200Ω	½		BTS-2200	Sound IF Amp. Cathode
R38	2200Ω	½		BTS-2200	Sound IF Amp. Cathode
R39	12KΩ	½ 20%	1	BTS-12K	Voltage Divider
R40	39KΩ	½ 5%	1		Sound IF Amp. Screen
R41	1000Ω	½ 20%		BTS-1000	Sound IF Amp. Plate Decoupling
R42	15KΩ	½ 20%		BTS-15K	De-emphasis
R43	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R44	6800Ω	½		BTS-6800	Ratio Det. Diode Load
R45	10Meg	½ 20%		BTS-10Meg	AF Amp. Grid
R46	390Ω	½ 20%	1	BTA-390	Decoupling
R47	330KΩ	½ 5%	½	BTS-330K 5%	Voltage Divider
R48	180KΩ	½ 5%	½	BTS-180K 5%	Output Grid
R49	470KΩ	½ 20%		BTS-470K	Isolation
R50	2.2Meg	½ 20%		BTS-2.2Meg	Sync Amp. Grid
R51	5000Ω	½			Sync Amp. Plate
R52	47KΩ	½ 20%		BTS-47K	Sync Clipper Cathode
R53	100KΩ	½		BTS-100K	Sync Clipper Plate
R54	15KΩ	½ 20%		BTS-15K	Voltage Divider
R55A	22KΩ	½		BTS-22K	Integrator Network
B	8200Ω	½	♦	BTS-8200	Integrator Network
C	8200Ω	½		BTS-8200	Integrator Network
R56	330KΩ	½ 20%	1	BTA-330K	Integrator Network
R57	33KΩ	½ 20%		BTS-33K	Vert. MV Grid
R58	1000Ω	½ 20%		BTS-1000	Vert. MV Cathode
R59	470KΩ	½ 20%		BTS-470K	Vert. MV Plate
R60	680KΩ	½ 20%		BTS-680K	Vert. MV Grid
R61	6.8 Meg	½ 20%		BTS-6.8Meg	Vert. MV Plate
R62	6.8Meg	½ 20%		BTS-6.8Meg	Vert. MV Plate
R63	5000Ω	½			Vert. Peaking
R64	2.2Meg	½ 20%		BTS-2.2Meg	Vert. Output Grid
R65	47KΩ	½ 20%		BTS-47K	Horiz. Phase Det. Grid
R66	100KΩ	½ 20%		BTS-100K	Horiz. Phase Det. Cathode
R67	680KΩ	½ 20%		BTS-680K	Horiz. Phase Det. Plate
R68	47KΩ	½ 20%	2	BTB-47K	Horiz. AFC Feedback
R69	470KΩ	½ 20%	½	BTS-470K	Horiz. AFC Filter
R70	1300Ω	½ 5%	½	BTS-1300 5%	Horiz. MV Cathode
R71	5600Ω	½ 20%	½	BTS-5600	Horiz. MV Plate

RESISTORS (CONT.)

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AMBASSADOR PART No.	IRC PART No.	IDENTIFICATION CODES
R72	100KΩ 20%	½		BTS-100K	Horiz. MV Grid
R73	220KΩ 20%	½		BTS-220K	Horiz. MV Plate
R74	1200Ω	2		BTB-1200	Horiz. MV Decoupling
R75	390Ω	½		BTS-390	Horiz. MV Decoupling
R76	88Ω	½			Parasitic Suppressor
R77	680KΩ	½		BTS-680K	Horiz. Output Grid
R78	6800Ω 20%	2		BTB-6800	Horiz. Output Screen
R79	10KΩ 20%	2		BTB-10K	Decoupling
R80	200Ω	10		1 3/4A-200	Filter - Wire Wound
R81	100KΩ	½		BTS-100K	Antenna Coil Shunt

♦ Items R55A, R55B, R55C, C43A, C43B, C43C are combined in one unit

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: AMBASSADOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC ② 1.68A	750VCT ③ .190 ALC	5VAC ② 3A	② 5.9A SEC. 4 6.3VAC ② 1.95A	TPC-10018	P-8169			

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: AMBASSADOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	465Ω Tap ② 65Ω	12Ω Tap ② .6Ω & 8Ω SEC. 2 3.8Ω SEC. 3 0Ω	THC-10003-D		HVO-7			Horiz. Output Trans.
T3	1KΩ Tap ② 12Ω		TOB-10045E	A-8123	A-3037	TSO-8	A-102-X ①	Vert. Output Trans.
T4A	14Ω		YDB-1000D	DY-9	MDF-70	TY-2	Y-12	Horiz. Deflection Coils
B	.55Ω							Vert. Deflection Coils

① Drill one new mtg. hole.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: AMBASSADOR PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	3.8KΩ	3.6Ω	335Ω	.6Ω	TOC-10034	A-3850 ①	A-3026	RO-302 ①	S-53X ①	① Drill one new mtg. hole

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: AMBASSADOR PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1A	5"	PM	3.6Ω		Mod. P5-X ST-105	5A07	

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: AMBASSADOR PART No.	MERIT PART No.	NOTES
L1	Ant. Coil	0Ω				
L2	Ant. Coil	0Ω				
L3	RF, Mixer Grid & Osc.	0Ω				Low Band
L4	RF Coil	0Ω				High Band
L5	Mixer Grid	0Ω				High Band
L6	Osc. Coil	0Ω				High Band
L7	Cath. Choke	.2Ω				
L8	Fil. Choke	.1Ω				
L9	RF Choke	0Ω				
L10	1st. Video IF	.1Ω				
L11	2nd. Video IF	.1Ω	.1Ω			
L12	3rd. Video IF	.1Ω	.1Ω			
L13	4th. Video IF	.1Ω	.1Ω			
L14	Peaking Coil	7.3Ω				
L15	Peaking Coil	12.2Ω				
L16	4.5MC Trap	11.7Ω				
L17	Sound IF	2.2Ω			TV-151	
L18	Ratio Det.	4Ω	.2ΩCT		TV-110	Tertiary Winding .4Ω
L19	Horiz. Osc.	62Ω				
L20	Width Coil	.5Ω			MWC-2	

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			AMBASSADOR PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	3AG Pigtail	1/4 A. 250V.			318.250		GJV 1/4	

MISCELLANEOUS

ITEM No.	PART NAME	AMBASSADOR PART No.	NOTES
M2	RF Tuner		
M3	Crystal		1N64
M4	Focus Magnet		
M5	Ion Trap		
B2	Trimmer	CT-10005	Horiz. Drive

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

VOLUME CONTROL ON-OFF SW

TUNING CONTROL

AUTOMATIC
MODEL C51

TRADE NAME	Automatic Model C-51
MANUFACTURER	Automatic Radio Mfg Co. Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Three Power Portable Superheterodyne Receiver
TUBES (Five)	Types 1U4 (or) 1T4 RF Amp., 1R5 Conv., 1U4 (or) 1T4 IF Amp., 1U5 Det.-AVC-AF Amp., 3V4 Audio Output.
POWER SUPPLY	115-125 Volts AC/DC or 9 Volts "A" Supply & 90 Volts "B" Supply
RATING	.150 Amp. @ 117 Volts AC or 50MA @ 9 Volts DC & 18MA @ 90 Volts DC
TUNING RANGE—BROADCAST	535-1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with the low side of the signal generator and chassis.
Volume control should be at maximum position. Output of signal generator shouldbe no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 6 (grid) of 1R5 (V2). Low side to chassis.	455 KC (400∿ Mod.)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transformer, reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	High side to pin 6 (grid) of V1. Low side to chassis.	1620 KC	"	"	A5	"
3.	"	"	1400 KC	Tune to 1400 KC signal	"	A6	"
4.	"	"	600 KC	Tune to 600 KC signal	"	A7	"
5.		Loop	1400 KC	Tune in 1400 KC signal	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver Adjust for maximum output. For best results repeat alignment procedure.

After alignment tune set to 1600 KC signal, replace set in cabinet and set pointer to "160".

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: AUTOMATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	EIA BASE TYPE	NOTES
V1A	RF Amplifier	1U4	1U4	6AR	
B	RF Amplifier	1T4	1T4	6AR	
V2	Converter	1R5	1R5	7AT	
V3A	IF Amplifier	1U4	1U4	6AR	
B	IF Amplifier	1T4	1T4	6AR	
V4	Det.-AVC-AF Amp.	1U5	1U5	6BW	
V5	Audio Output	3V4	3V4	6BX	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUTOMATIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	●50	150	CE-36	AFH4-23		UP64215X-20		FP408		
B	■30	150								
C	▲25	150								
D	200	10								
C2	10	50	C205	PRS50/10		BR105		TC32	TVA-1304	
C3	.1	200	C208	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C4	.1	200	C208	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C5	.1	200	C208	P288-1	DF-104	PJ2P1		PT401	2TM-P1	Note 1
C6	.05	200	C207	P288-05	DF-503	PJ2S5		PT415	42TM-S5	
C7	100		CC200	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C8	.01	600	C206	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C9	100		CC200	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C10	.002	600	C203	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C11	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	Note 2
C12	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	Note 3
C13A	50			SI50		TM5Q5		UC-545	5GA-Q5	
B	5000			BPD-005	♦PC-90	TM5D5	♦1407-01	DC-525	5HK-D5	
C	2000			BPD-002		TM5D2		DC-522	5HK-D2	
C14	.002	600	C203	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C15	.05	400	C204	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C16	10			SI10	D6-100		GP1K-100	UC-541	5GA-Q1	Note 1

Note 1. Not used in all models.
Note 2. Some models use 200MMF in this application (Part #CC201)
Note 3. Some models use 100MMF in this application (Part #CC200)
♦ Items C13A, C13B, C13C, R8A, R8B, R8C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	½	RV44C	Q13-137	AG-63-Z	B-70-S	U-53	Volume - See Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

Note: Some models use alternate control (Part #RV58)

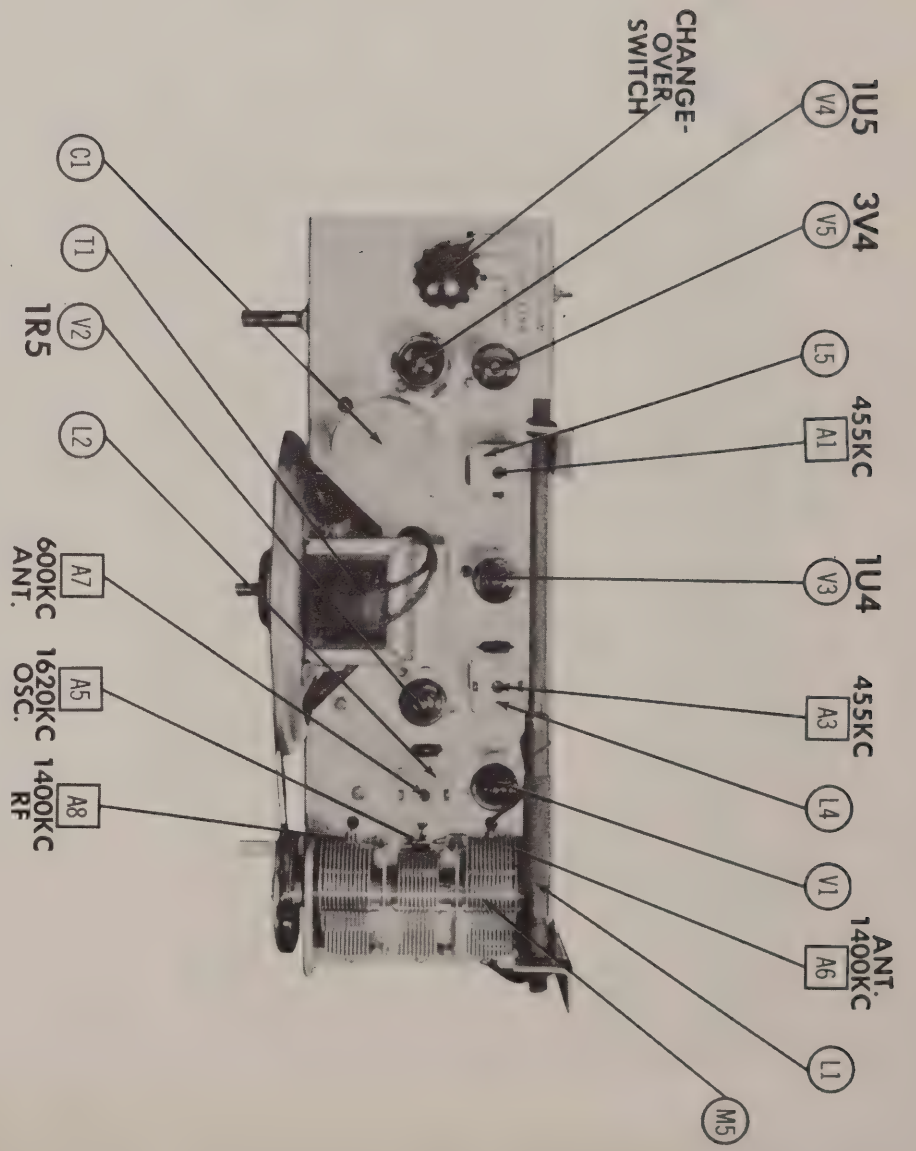
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	IRC PART No.	NOTES
R2	1.2Meg	½		BTS-1.2 Meg	See Note 1
R3	150KΩ	½	R315	BTS-150K	
R4	8.2Meg	½		BTS-8.2 Meg	Note 2
R5	2Meg	½	R310		
R6	10KΩ	½	R316	BTS-10K	
R7	8.2Meg	½		BTS-8.2 Meg	Note 2
R8 A	4.7Meg	½		BTS-4.7 Meg	
B	1Meg	½	♦	BTS-1Meg	
C	2.2Meg	½		BTS-2.2 Meg	
R9	4.7Meg	½		BTS-4.7 Meg	Note 2

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: PART No.	IRC PART No.	NOTES
R10	750Ω	½	R320		Note 3
R11	820Ω	½	R317	BTS-820	
R12	100Ω	2	R318		
R13	2025Ω	10	R319	1 3/4A-2000	
R14	750Ω	½	R320		
R15	1000Ω	½	R321	BTS-1000	
R16	1800Ω	½		BTS-1800	Note 4
R17	820Ω	½	R317	BTS-820	

Note 1. Some models use a 1Meg resistor in this application.
Note 2. Some models use a 10Meg resistor in this application.
Note 3. Some models use a 820Ω resistor in this application.
Note 4. Some models use a 1500Ω resistor in this application.
♦ Items R8A, R8B, R8C, C13A, C13B, C13C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	10KΩ	3.4Ω	570Ω	.58Ω	Part of Spkr PM 250	A-3856	A-2927 ①	RO-16	S-11X	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.1Ω	PM-250	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	AUTOMATIC PART No.	MERIT PART No.	
L1	Loop Antenna	.2Ω		L-A51		
L2	RF Coil	90Ω	6.5Ω	57FB-4		
L3	Osc. Coil	2Ω	8.7Ω	L-051		
L4	Input IF	19Ω	19Ω	1655-16		
L5	Output IF	19Ω	19Ω	1655-16		

SELENIUM RECTIFIER

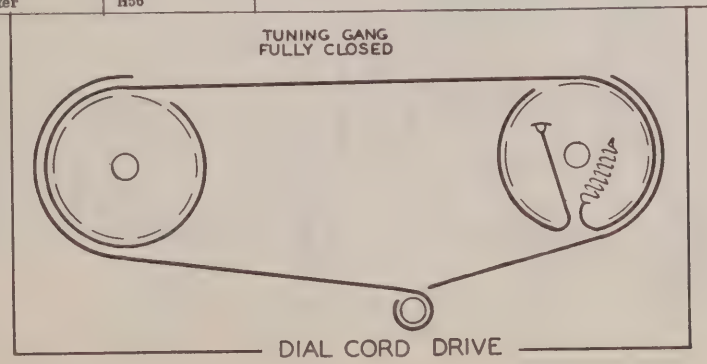
ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	AUTOMATIC PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.074A	S1	NB5	5M4	1003	6S75	

BATTERIES

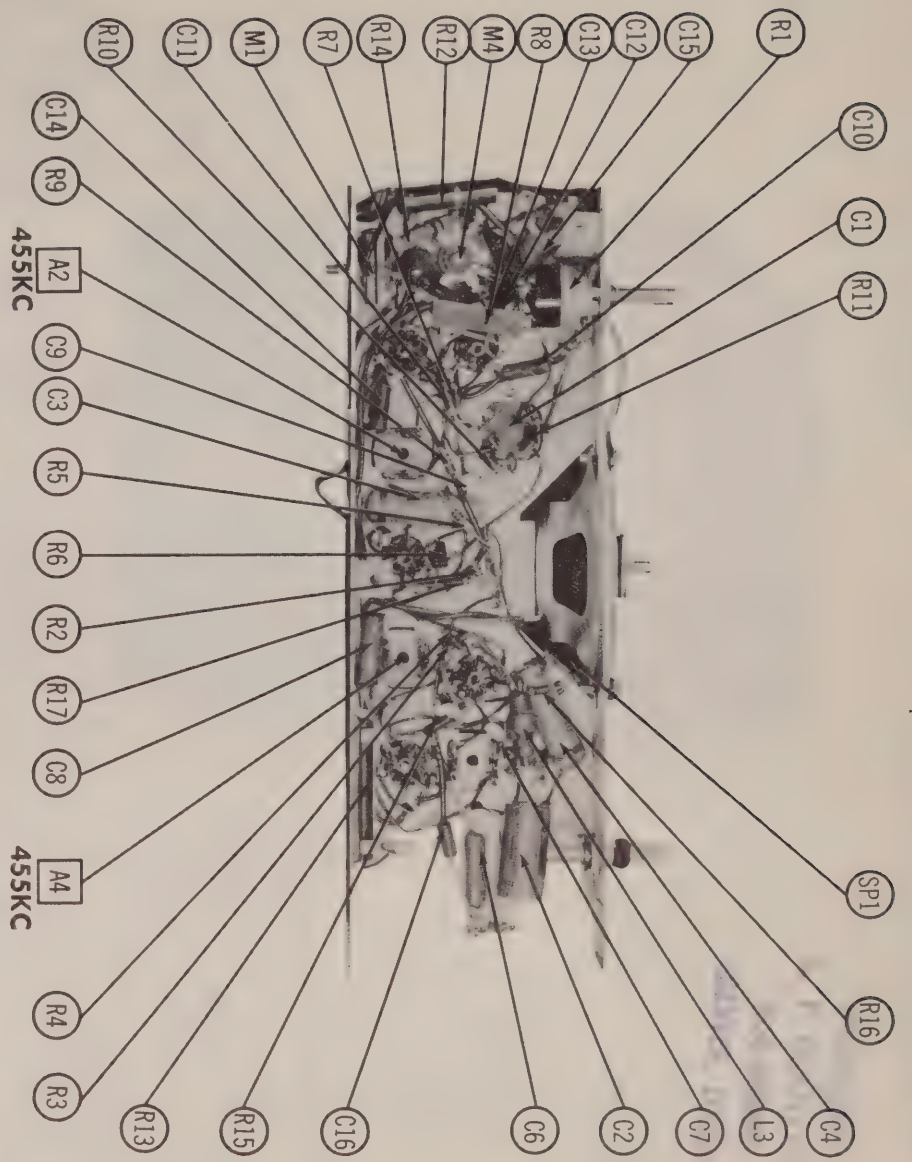
ITEM No.	VOLTAGE	AUTOMATIC PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M 2	4.5 V.		746			G3			2 used in series
M3	45 V.			482			M30		2 used in series

MISCELLANEOUS

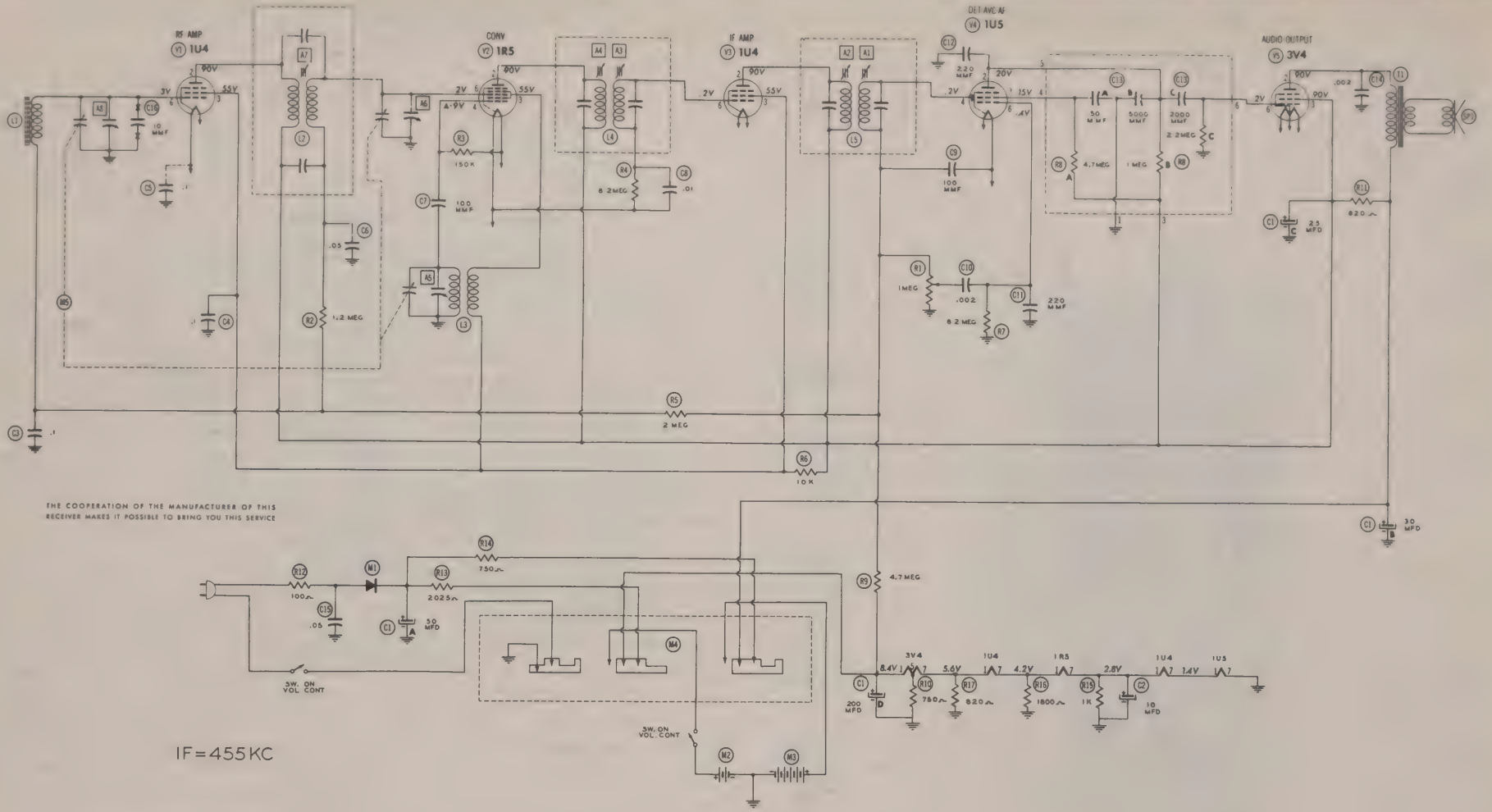
ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
M4	Switch	SW-602A	Power Change-over
M5	3 Gang Var. Cap.	CV-300	(31-417MMF, 18-395MMF, 30-207MMF)
	Cabinet	H53	Less Back
	Cabinet Back	H54	
	Knob	H51	
	Dial	H55	Plastic
	Pointer	H56	



CHASSIS—BOTTOM VIEW



AUTOMATIC MODEL C-51



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1U4	*	†1.6KΩ	†11KΩ	*	*	1.7Meg	*
V 2	1R5	*	†1.6KΩ	†11KΩ	150KΩ	*	2.9Meg	*
V 3	1U4	*	†1.6KΩ	†11KΩ	†1.6KΩ	*	10Meg	*
V 4	1U5	*	†1Meg	†4.7Meg	700KΩ	INF	8.2Meg	*
V 5	3V4	*	†1.3KΩ	†1.6KΩ	INF	*	2.2Meg	*

ALL MEASUREMENTS TAKEN IN AC-DC POSITION
† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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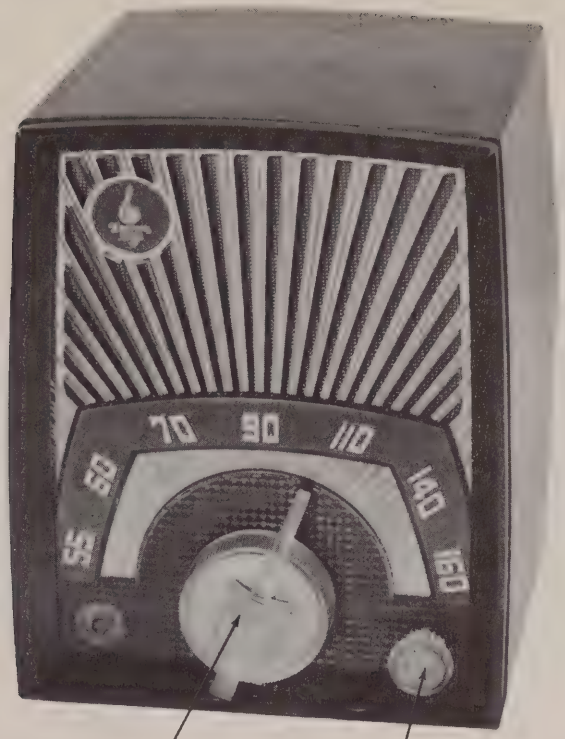
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON MODELS
706B, 707B (Ch. 120156-B)



TUNING CONTROL

VOLUME CONTROL ON-OFF SW

EMERSON MODELS
706B, 707B (Ch. 120156-B)

MERSON MODEL 707-B

TRADE NAME	Emerson Models 706-B, 707-B (Ch. 120156-B)
MANUFACTURER	Emerson Raido & Phono Corp., 111 Eighth Ave., NewYork, N.Y.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AV6 (or) 12AT6 Det. -AVC-AF Amp., 50C5 (or) 50B5 Audio Output, 35W4 Rectifier
POWER SUPPLY	105-125 Volts AC/DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1 MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1Mfd.	High side to pin 7 (grid) of 12BE6 (V1) Low side to B-	455KC (400~Mod.)	Tuning gang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD. to reduce hum modulation.
2.		Loop	1620KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	Tune to 1400KC signal.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

EMERSON
MODEL 706-B (Ch. 120156-B)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3A	Det. -AVC-AF Amp	12AV6	12AV6	7BT	
B	Det. -AVC-AF Amp	12AT6	12AT6	7BT	
V4A	Audio Output	50C5	50C5	7CV	
B	Audio Output	50B5	50B5	7BZ	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd, for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	30	150	925218	PRS150/50-30		BRD5315A		TCD497	TVA-2450	Red
B	50	150								Green
C2	.05	400	923554	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3A	220									
B	2000									
C	5000		♦923024		♦PC-150		♦1408-01		103C4	
D	250									
E										
C4	.02	400	923524	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C5	.05	400	923554	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C6	.1	200	923315	P288-1	DF-104	PJ2P1		PT401	2TM-P1	

♦ Items C3A, C3B, C3C, C3D, C3E, R5A, R5B, R5C are combined on one unit.
When placing items seperately, C3D and C3E should total 250MMF.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	390195	Q11-133	AG-58-S	AB-59	U-50	Volume- See Note
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

Note Some models use alternate control (part no. 390205)

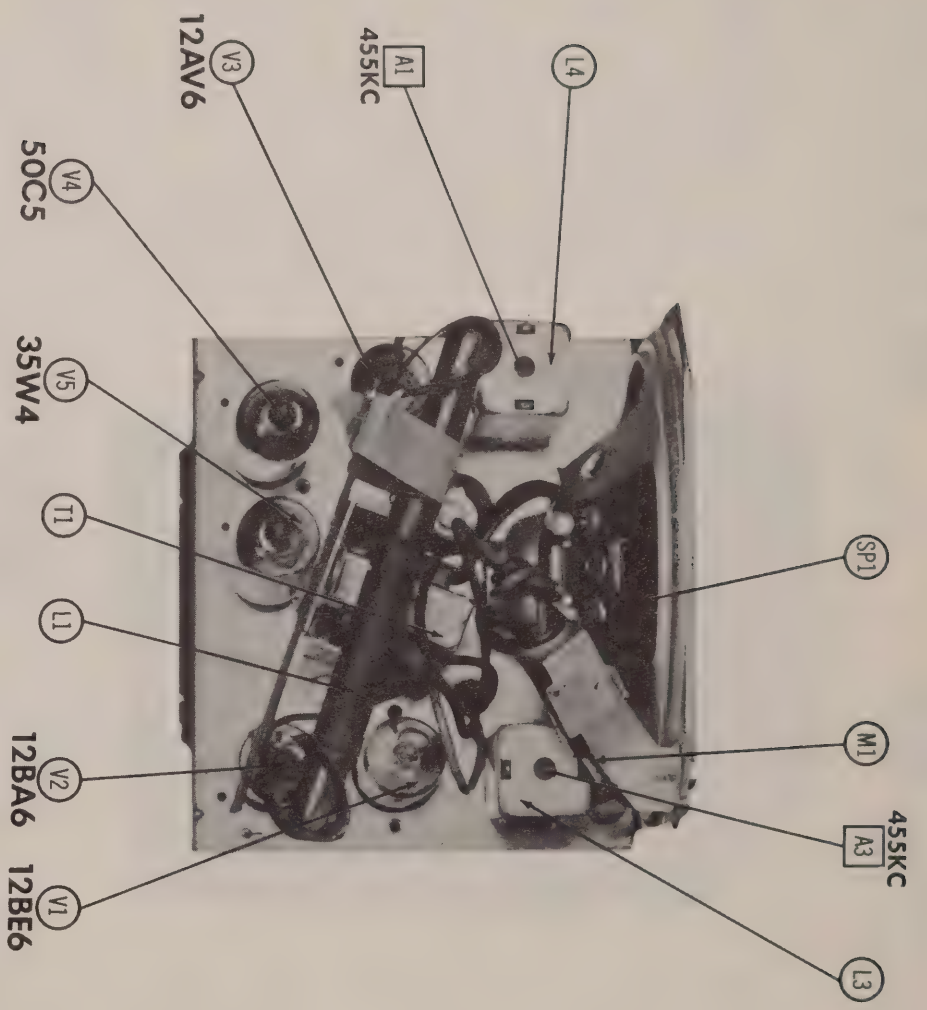
RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	NOTES
R2	22KΩ	½		BTS-22K	
R3	120Ω	½	340272	BTS-120	
R4	3.3 Meg.	½	351332	BTS-3.3 Meg.	
R5A	6.8Meg	½		BTS-6.8 Meg.	
B	470KΩ	½	♦923024	BTS-470K	
C	470KΩ	½		BTS-470K	

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: PART No.	IRC PART No.	NOTES
R6	150Ω	½	340292	BTS-150	
R7	1500Ω	1	380532	BTA-1500	
R8	18Ω	½	340072		

♦ Items R5A, R5B, R5C, C3A, C3B, C3D, C3C are combined in one unit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T-1	2KΩ	190Ω	3.3Ω	.8Ω	734077 Part of 180084 ①	A-3332	A-3025	R0-2	S-2X	① Alternate audio output.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.3Ω	180032H 180084 ①	ST-113 Mod. P4-X	4A07	① Alternate 4" PM speaker

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	EMERSON PART No.	MERIT PART No.	
L1	Loop Ant.	.4Ω		700066		
L2	Osc. Coil	.4Ω	6.7Ω	716071		
L3	Input IF	17.5Ω	17.5Ω	720033		
L4	Output IF	17.5Ω	17.5Ω	720033		

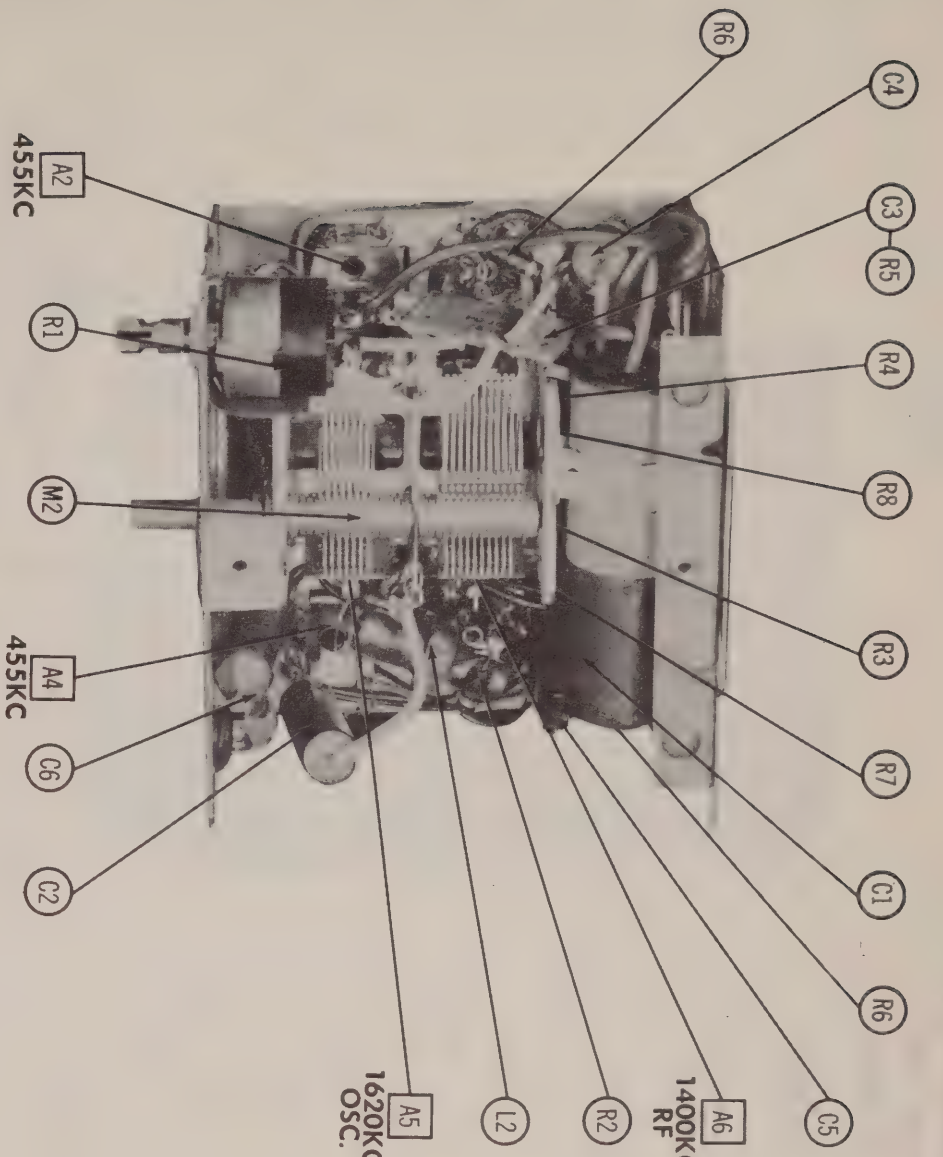
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					EMERSON PART No.		
M1	Bayonet	6-8	.15	Brown	807000		Type No. 47

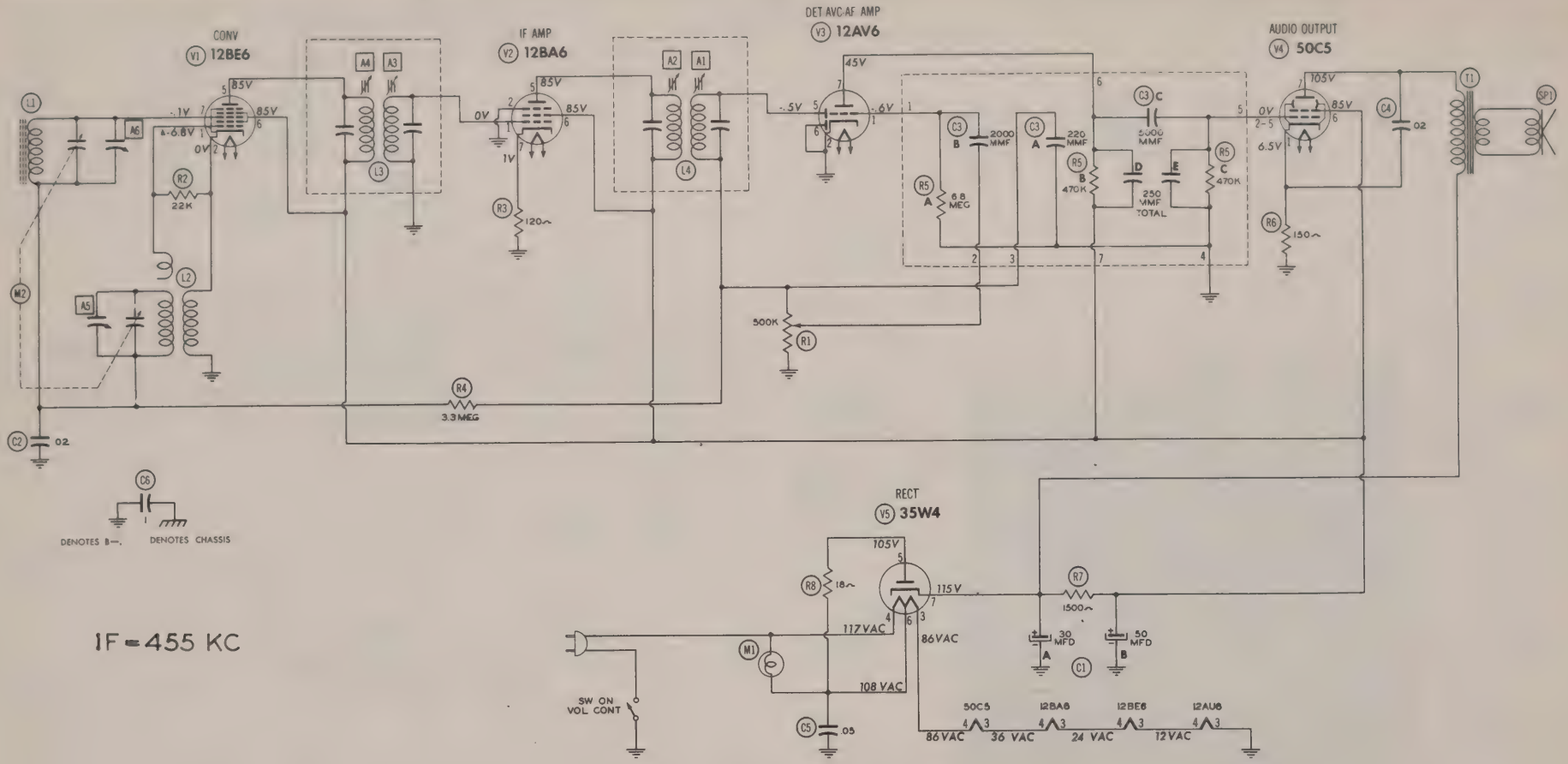
MISCELLANEOUS

ITEM No.	PART NAME	EMERSON PART No.	NOTES
M1	2 Gang Var. Cap.	900066	(35-397MMF, 27-177MMF)
	Cabinet	140450	Walnut
	Cabinet	140450A	Ivory
	Cabinet	140450B	Grey
	Cabinet	140450C	Maroon
	Cabinet	140450 D	Pink
	Cabinet	140450E	Gunmetal
	Cabinet	140450F	Yellow
	Knob	460274	Tuning-Model 706B
	Knob	460314	Tuning-Model 707B
	Knob	460311	Volume-Models 706B & 707B

CHASSIS—BOTTOM VIEW



EMERSON
MODEL 706-B (Ch. 120156-B)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.4Ω	12Ω	24Ω	†1.5KΩ	†1.5KΩ	3.8 Meg.
V 2	12BA6	17.5Ω	0Ω	24Ω	36Ω	†1.5KΩ	†1.5KΩ	120Ω
V 3	12AV6	6.8Meg.	0Ω	0Ω	12Ω	500KΩ	∞	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1.5KΩ	†190Ω
V 5	35W4	INF	INF	86Ω	121Ω	121Ω	103	60KΩ

† MEASURED FROM PIN 7 OF V5.
♦ TAKEN WITH VACUUM TUBE VOLTMETER.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

FADA
MODEL P 111

FADA
MODEL P 111

TRADE NAME	Fada Model P111
MANUFACTURER	Fada Radio & Electric Co., Inc., 525 Main St, Belleville, N.J.
TYPE SET	Three Power Portable AM Superheterodvne Receiver
TUBES (FOUR)	Types 1R5 Conv., 1T4 IF Amp., 1U5 (or) 1S5 Det.-AVC-AF Amp., 3V4 (or) 3S4 Audio Output.
POWER SUPPLY RATING	110-120 Volts AC/DC or 1.5 Volts "A" Supply & 67.5 Volts "B" Supply .15 Amp. @ 117 Volts AC or 250 MA @ 1.5 Volts CDC & 12 MA @ 67.5 Volts DC
TUNING RANGE—BROADCAST	538-1650KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1 MFD	High side to pin 6 (grid) of 1R5(V1) Low side to chassis	456KC (400~Mod)	Point of non interferince	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If AC power is used without an isolation transforner reduce dummy antenna to 200MMF to reduce hum modulation.
2.	"	"	1650KC	Tuning gang fully open.	"	A5	"
3.		Loop	1400KC	Tune to 1400KC signal.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	600KC	Tune to 600KC signal.	"	A7	Adjust for maximum output while rocking tuning gang. Repeat steps 2 and 3.

Use battery power when available. If AC power is used, use an isolation transformer when available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.

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PARTS LIST AND DESCRIPTIONS

FADA MODEL P111

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: FADA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	1R5	1R5	7AT	
V2	IF Amp.	1T4	1T4	6AR	
V3A	Det.-AVC-AF Amp.	1U5	1U5	6BW	
b	Det.-AVC-AF Amp.	1S5	1S5	6AU	
V4A	Audio Output	3V4	3V4	6BX	
b	Audio Output	3S4	3S4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: FADA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150	22.64	PRS150/40-		BRD4415-		TCD48	TVA-2445	
B	40	150		40		A				
C2	150	15	22.13	PRS15/100		BRH5015		TC1502	TVA-1311	
C3	100	15	22.5	PRS15/100		BRH15A		TC2501	TVA-1160	
C4	.05	200	12.11	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5	100		17.21	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C6	.05	200	12.11	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C7	.1	200	12.13	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C8	200		17.7	SI200	D6-201	TM5T2	GP2K-201	UC-532	5GA-T2	
C9	.002	200	12.1	SI2000	D6-202	TM5D2	GP2-333-202	UC-522	5HK-D2	
C10	.1	200	12.14	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C11	50		17.18	SI50	D6-500	TM5Q5	GP1K-500	UC-541	5GA-Q5	
C12	.002	200	12.1	SI2000	D6-202	TM5D2	GP2-333-202	UC-522	5HK-D2	
C13	.002	200	12.1	SI2000	D6-202	TM5D2	GP2-333-202	UC-522	5HK-D2	
C14	.05	400	12.12	P488-05	DF-503	PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: FADA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	52.54	Q13-133	AG-60-Z	B-60-E	U-46	Volume control
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-2	SWB-2	Not Req.	US-27	Attach to R1A

RESISTORS

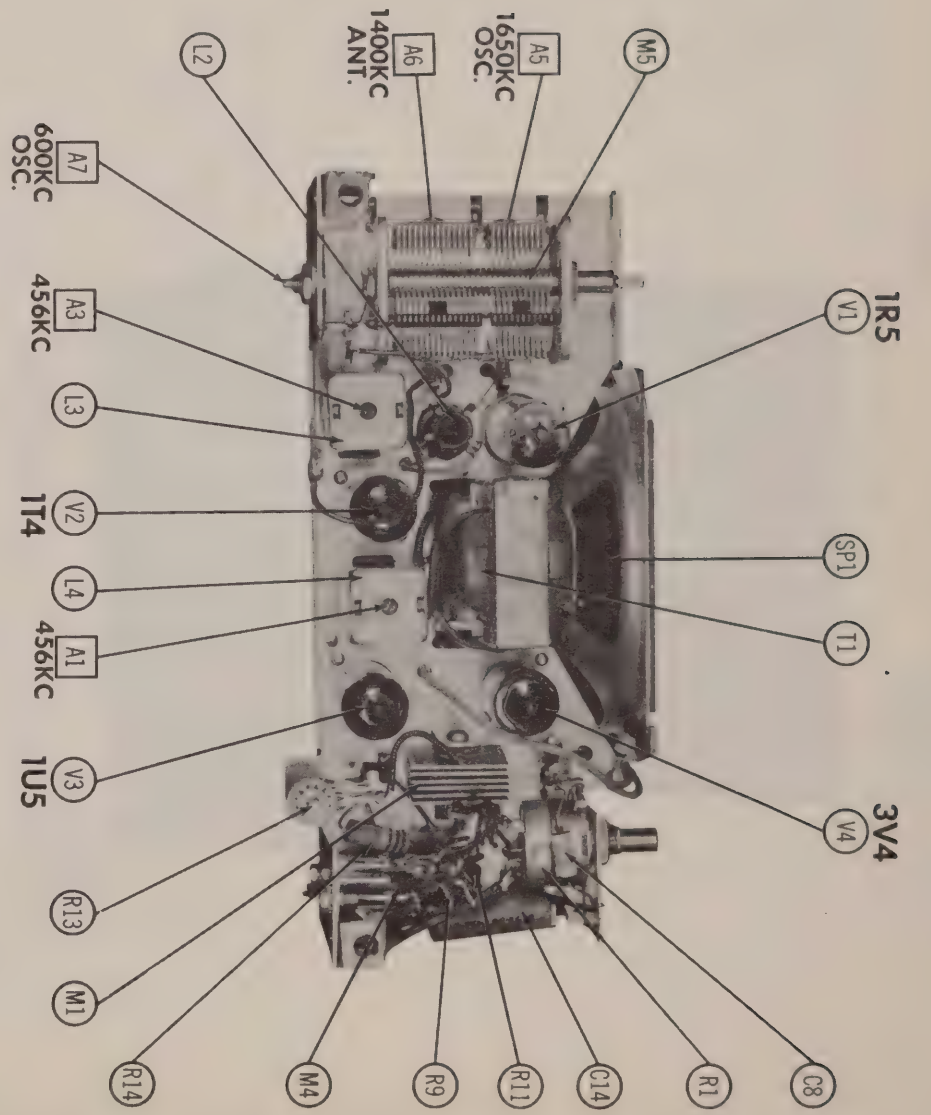
ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: FADA PART No.	IRC PART No.	NOTES	ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: PART No.	IRC PART No.	NOTES
R2	100KΩ	½	32.17	BTS-100K		R8	2.2Meg	½	32.34	BTS-2.2Meg	
R3	3300Ω	½	32.32	BTS-3300		R9	1000Ω	½	32.8	BTS-1000	
R4	2.2Meg	½	32.34	BTS-2.2 Meg.		R10	680Ω	½	32.81	BTS-680	
						R11	2200Ω	½	32.60	BTS-2200	
R5	6.8Meg	½	32.41	BTS-6.8 Meg		R12	680Ω	½	32.31	BTS-680	
						R13A	2100Ω	10	117.15		
R6	3.9Meg	½	32.36	BTS-3.9 Meg		B	75Ω	5			
						R14	2000Ω	1	32.56	BTA-2200	
R7	180KΩ	½		BTS-180K	Note 1	R15	270Ω	½		BTS-270	Note 2

Note 1. Some models use 680KΩ resistor in this application.
Note 2. Some models use 590Ω resistor in this application.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: FADA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	8.3KΩ	3.2Ω	378Ω	.53Ω	P-234B	A8114 ①	A2900①	R0-301 ①	S-8X ①	Bend mtg. tabs down, file out slots mount on original mounting bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	FADA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	107.49	ST-113 Mod. P4-X	4A07	

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	FADA PART No.	MERIT PART No.	
L1	Loop Ant.	2Ω		37.189		209 Microhenries @ 26 MMF
L2	Osc. Coil	.4Ω	2.5Ω	37.184		
L3	Input IF	27Ω	27Ω	37.188	BC-352	
L4	Output IF	27Ω	27Ω	37.188	BC-353	

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	FADA PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.069 Amp.	1003A	NB5	5M4	1003	6S75	

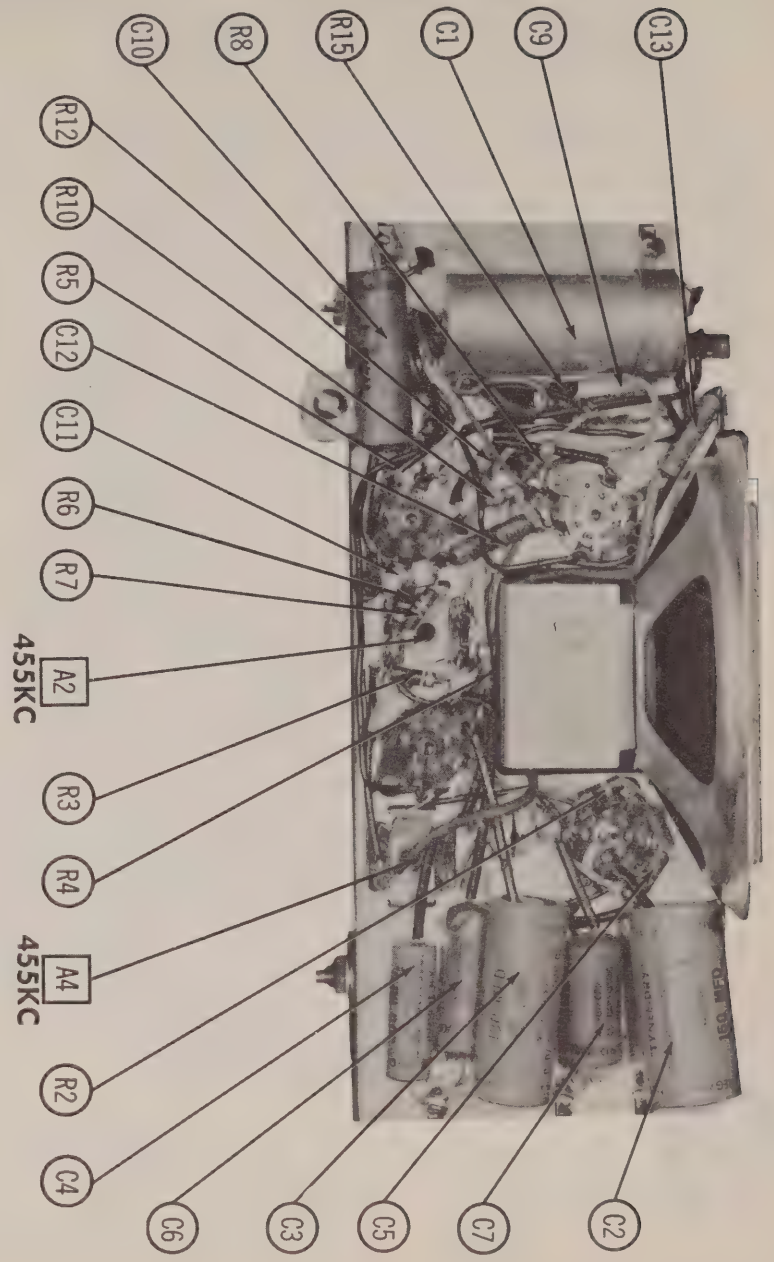
BATTERIES

ITEM No.	VOLTAGE	PART No.	REPLACEMENT DATA						INSTALLATION NOTES
			EVEREADY			BURGESS			
			"A"	"B"	"A-B"	"A"	"B"	"A-B"	
M2	1.5V		950			2R			3 Required in parallel
M3	67.5V			467			XX45		

MISCELLANEOUS

ITEM No.	PART NAME	FADA PART No.	NOTES
M4	Switch	47.23	(Power Change-over)
M5	2 Gang Var. Cap.	27.36	(21-347MMF, 16-256MMF)
A7	Trimmer	132.10	Osc. Padder

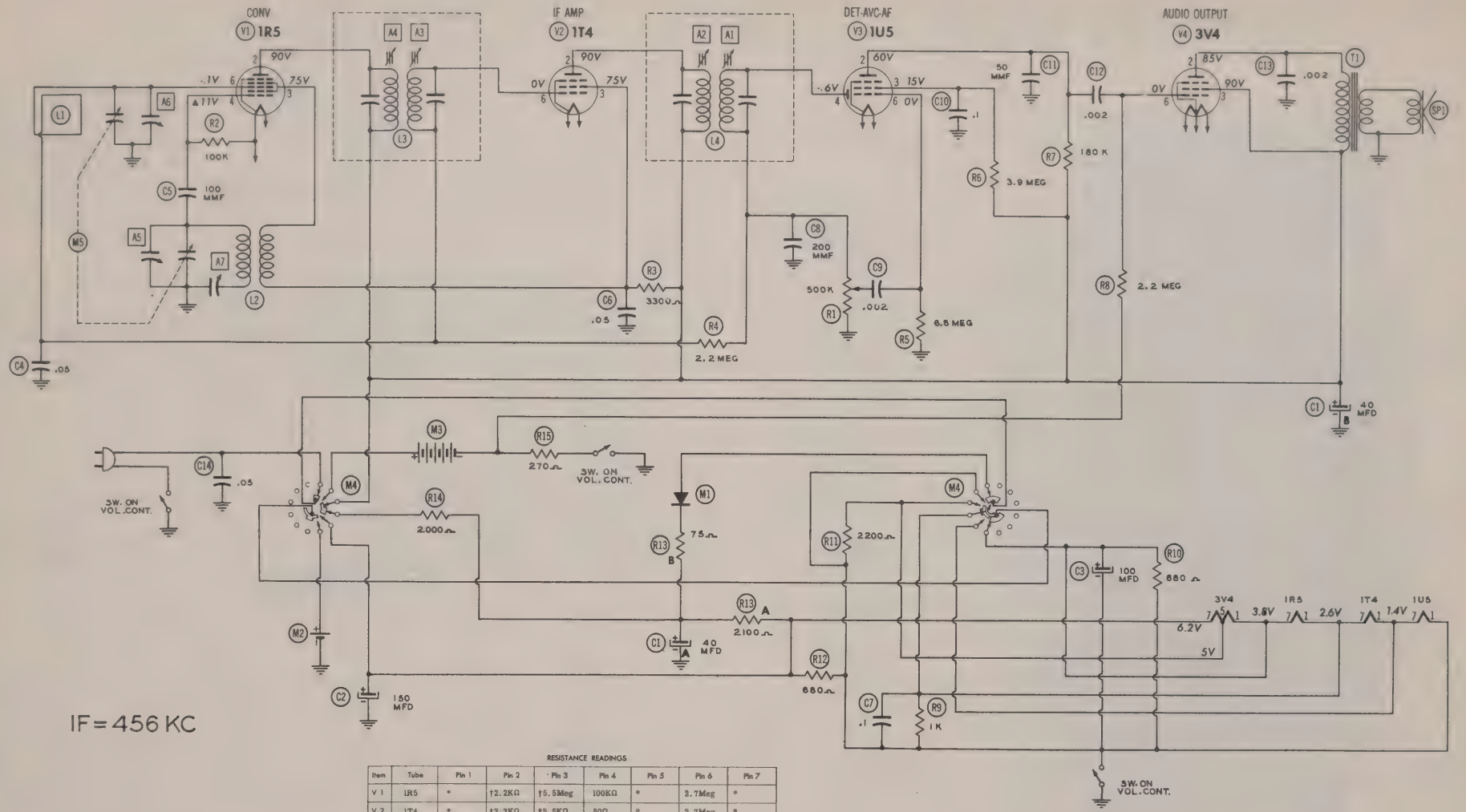
CHASSIS—BOTTOM VIEW



SET 178 FOLDER 6

FADA MODEL P111

FADA MODEL P111



IF = 456 KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	1R5	*	†2.2KΩ	†5.5Meg	100KΩ	*	2.7Meg	*
V 2	1T4	*	†2.2KΩ	†5.5KΩ	50Ω	*	2.7Meg	*
V 3	1U5	*	†180K	†3.9Meg	500KΩ	INF	6.8Meg	*
V 4	3V4	*	†2.5KΩ	†2.2KΩ	INF	*	2.2Meg	*

ALL MEASUREMENTS TAKEN WITH POWER CHANGE-OVER SWITCH IN "E" LINE POSITION
† MEASURED FROM OUTPUT OF M1
▲ TAKEN WITH VACUUM TUBE VOLTMETER
* DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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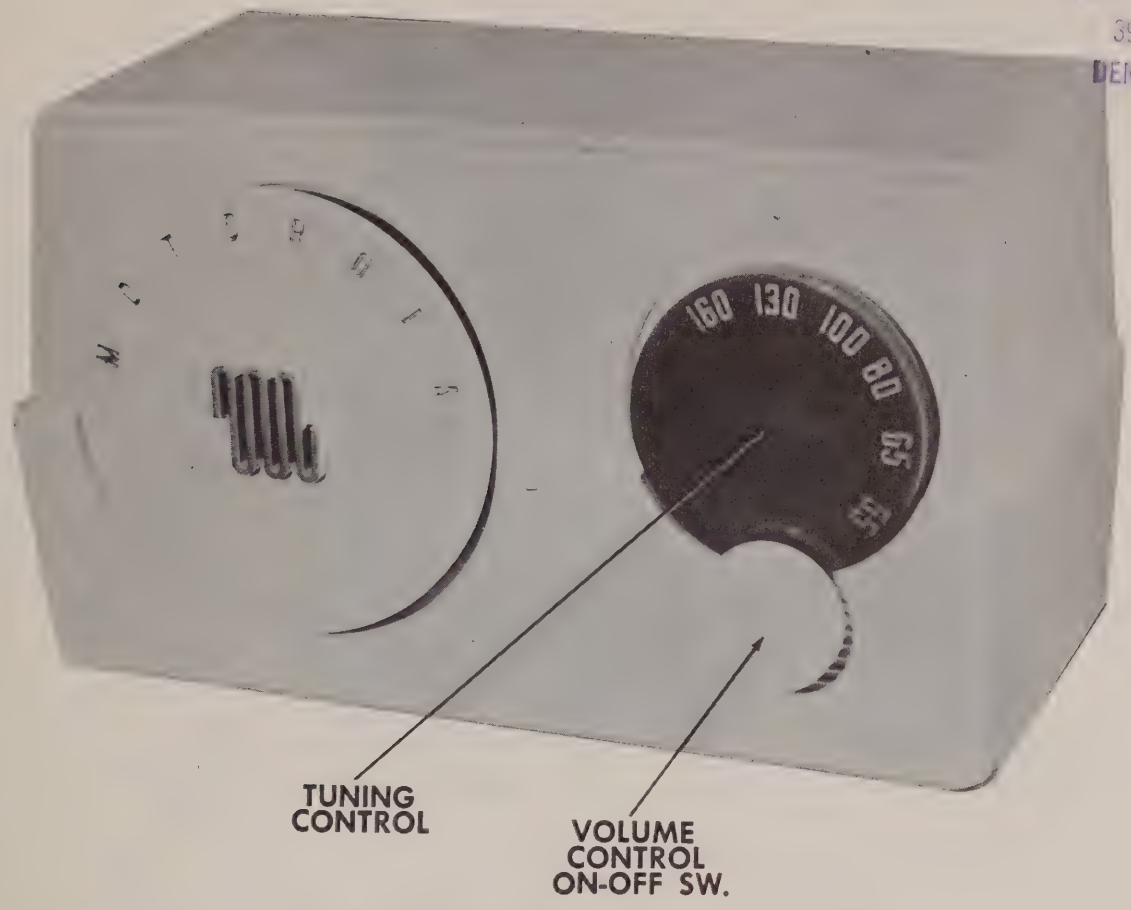
178-6

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MOTOROLA MODELS 52R11A, 52R12A, 52R13A, 52R14A, 52R15A, 52R16A (Ch. HS-317)

PROPERTY OF
L. F. BLAIR
3970 MEADE ST.
DENVER, COLORADO

MOTOROLA MODELS 52R11A, 52R12A, 52R13A, 52R14A, 52R15A, 52R16A (Ch. HS-317)



MOTOROLA MODELS 52R11A, 52R12A, 52R13A, 52R14A, 52R15A, 52R16A (Ch. HS-317)

MOTOROLA MODEL 52R12A

TRADE NAME	Motorola Models 52R11A, 52R12A, 52R13A, 52R14A, 52R15A, 52R16A (Ch.HS-317)
MANUFACTURER	Motorola Inc., 4545 Augusta Blvd., Chicago 51, Ill.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (Five)	Types 12BE6 Conv., 12BD6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-DC — RATING .25 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	535 - 1620 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and chassis.

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455 KC (400∿ mod.)	Tuning gang fully open	Across voice coil	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1620 KC	"	"	A5	"
3.		Loop	1400 KC	Tune to 1400 KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BD6	12BD6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	50	150	23B600855	PRS150/50--30		EDL5315		TCD497	TVA-2450	+Red +Green
B	30	150								
C2	.05	200	8R9821	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3A	220		21B482847	SI220	D6-221	5W5T25	GP2K-221	UC-5322	34C3	
B	2000			BPD-002	DD-202	TM5D2	811-002	DC-522		
C	220			SI220	D6-221	5W5T25	GP2K-221	UC-5322		
D	5000			BPD-005	DD-502	TM5D5	811-005	DC-525		
C4	10000		21K482726	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C5	.047	400	8R490232	P488-047		PTE4S47		PT4147	4TM-S47	

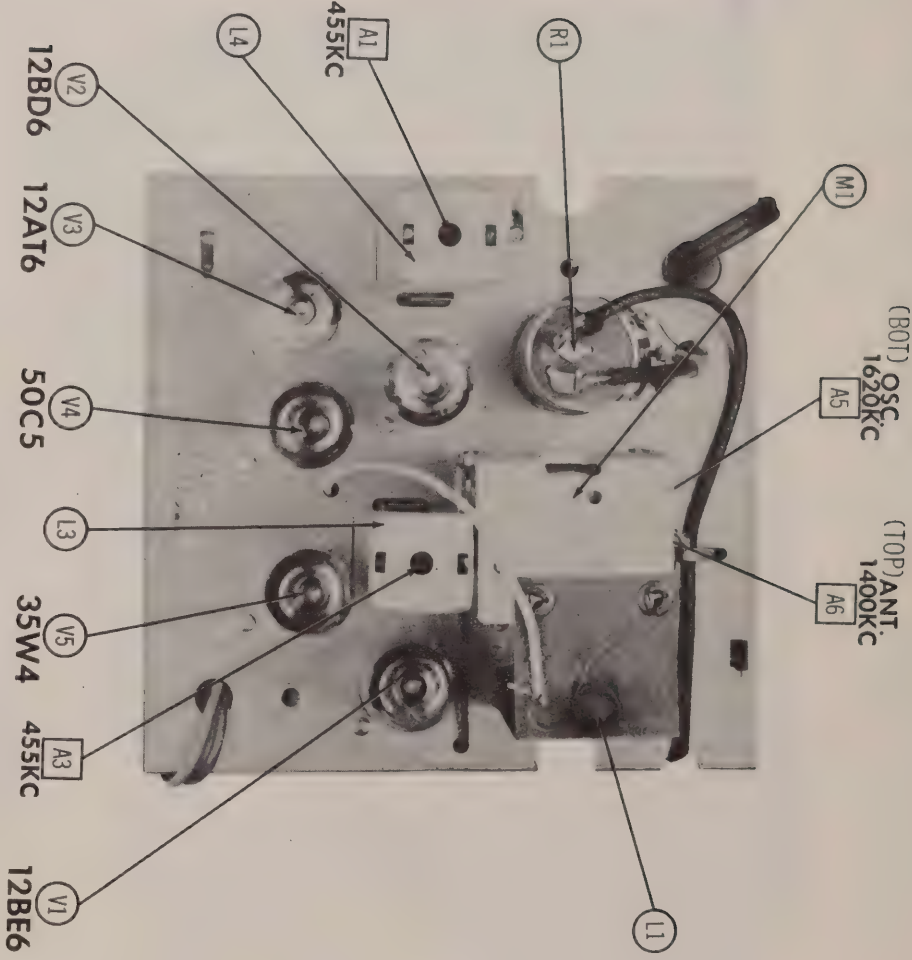
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1Meg	1/2	18A610640	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	22KΩ	1/2	6R6028	BTS-22K	
R3	100Ω	1/2	6R6018	BTS-100	
R4	3.3Meg	1/2	6R2118	BTS-3.3 Meg	
R5	10Meg	1/2	6R2109	BTS-10Meg	
R6	470KΩ	1/2	6R6032	BTS-470K	
R7	470KΩ	1/2	6R6032	BTS-470K	
R8	150Ω	1/2	6R3992	BTS-150	
R9	27Ω	1/2	6R5683		
R10	1000Ω	1	6R3953	BTA-1000	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2.2KΩ	3.2Ω	237Ω	.43Ω	25K610631	A-3332	A-3025		S-2X ①	① Drill one new mtg. hole.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	MOTOROLA PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	3.2Ω	50C611188	ST-113 Mod. P-4X	4A07	

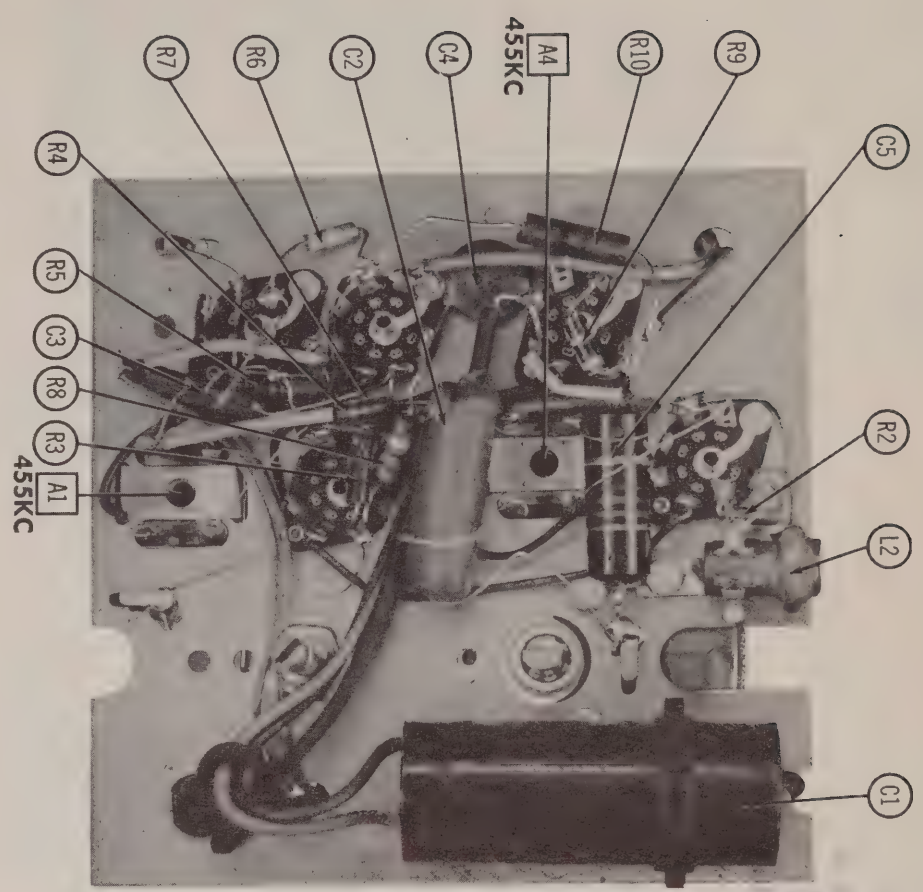
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	MOTOROLA PART No.	MERIT PART No.	
L1	Loop Ant.	3.4Ω		24A610646		Tap @ .6Ω
L2	Osc. Coil	10.5Ω		24K611180		
L3	Input IF	17Ω	17Ω	24C485553	BC-352	
L4	Output IF	17Ω	17Ω	24C485553	BC-353	

MISCELLANEOUS

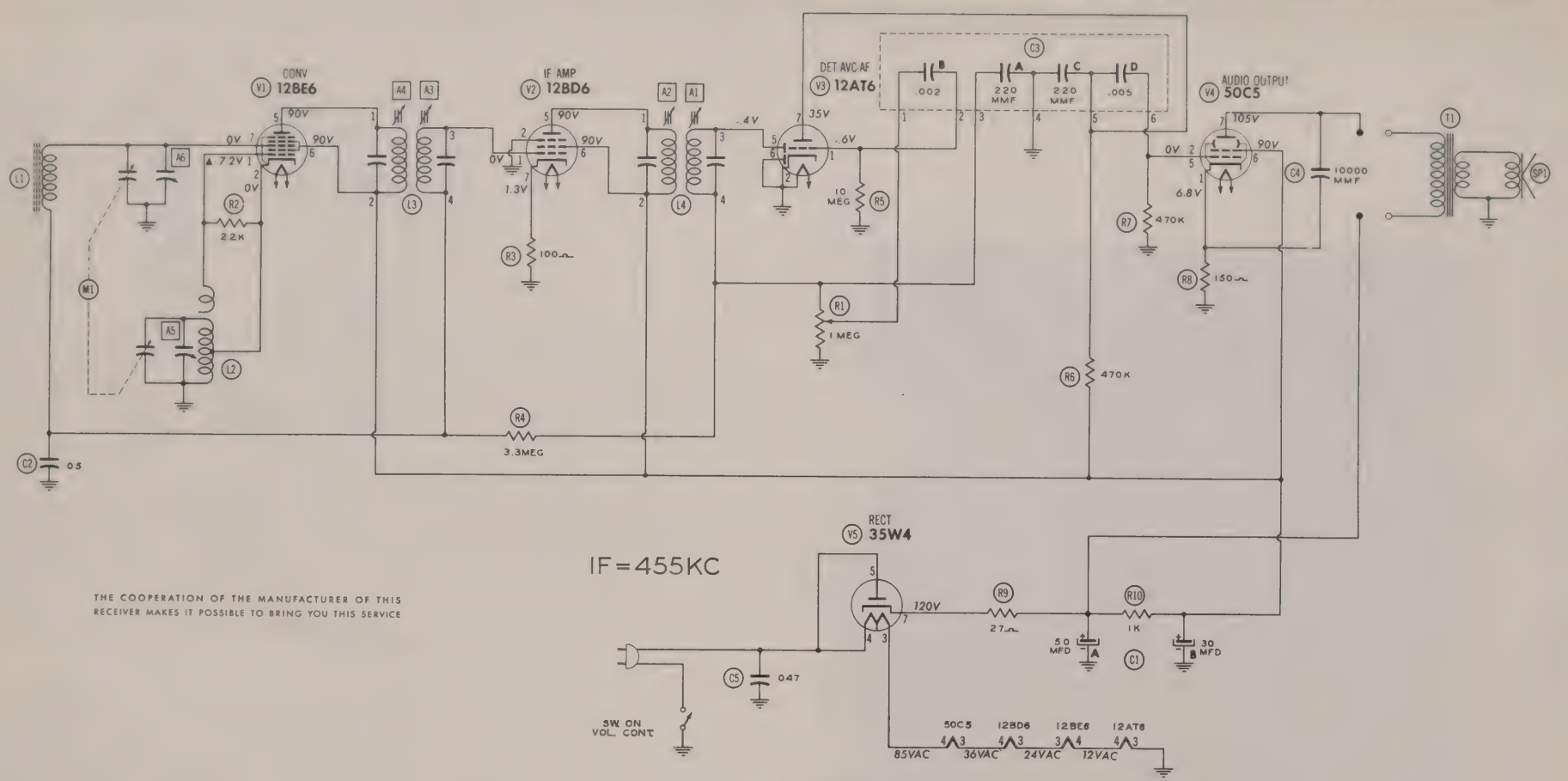
ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
M1	2 Gang Var. Cap.	19B610626	(25-394MMF, 17-157MMF)
	Cabinet	16C611255	Walnut - Model 52R11A
	Cabinet	16K611256	Ivory - Model 52R12A
	Cabinet	16K611258	Maroon - Model 52R13A
	Cabinet	16K611259	Gray - Model 52R14A
	Cabinet	16K611260	Green - Model 52R15A
	Cabinet	16K611261	Red - Model 52R16A
	Knob	36B610628	Tuning (Tan) - (52R11A, 52R12A)
	Knob	36K611306	Tuning (Black) - (52R13A, 52R16A)
	Knob	36K611307	Tuning (Green) - (52R14A, 52R15A)
	Knob	36A610641	Volume (Brown) - Model 52R11A
	Knob	36K610642	Volume (Ivory) - Model 52R12A
	Knob	36K611302	Volume (Maroon) - Model 52R13A
	Knob	36K611303	Volume (Gray) - Model 52R14A
	Knob	36K611304	Volume (Green) - Model 52R15A
	Knob	36K611305	Volume (Red) - Model 52R16A

CHASSIS—BOTTOM VIEW



MOTOROLA MODEL 52R11A (Ch. HS-317)

MOTOROLA MODEL 52R11A (Ch. HS-317)



THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.6Ω	24Ω	12Ω	†1KΩ	†1KΩ	4.3Meg
V 2	12BD6	4.3Meg	0Ω	24Ω	36Ω	†1KΩ	†1KΩ	100Ω
V 3	12AT6	10Meg	0Ω	0Ω	12Ω	1Meg	0Ω	†470KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†1KΩ	†264Ω
V 5	35W4	†27Ω	INF	86Ω	121Ω	121Ω	103Ω	50KΩ

† MEASURED FROM PIN 7 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

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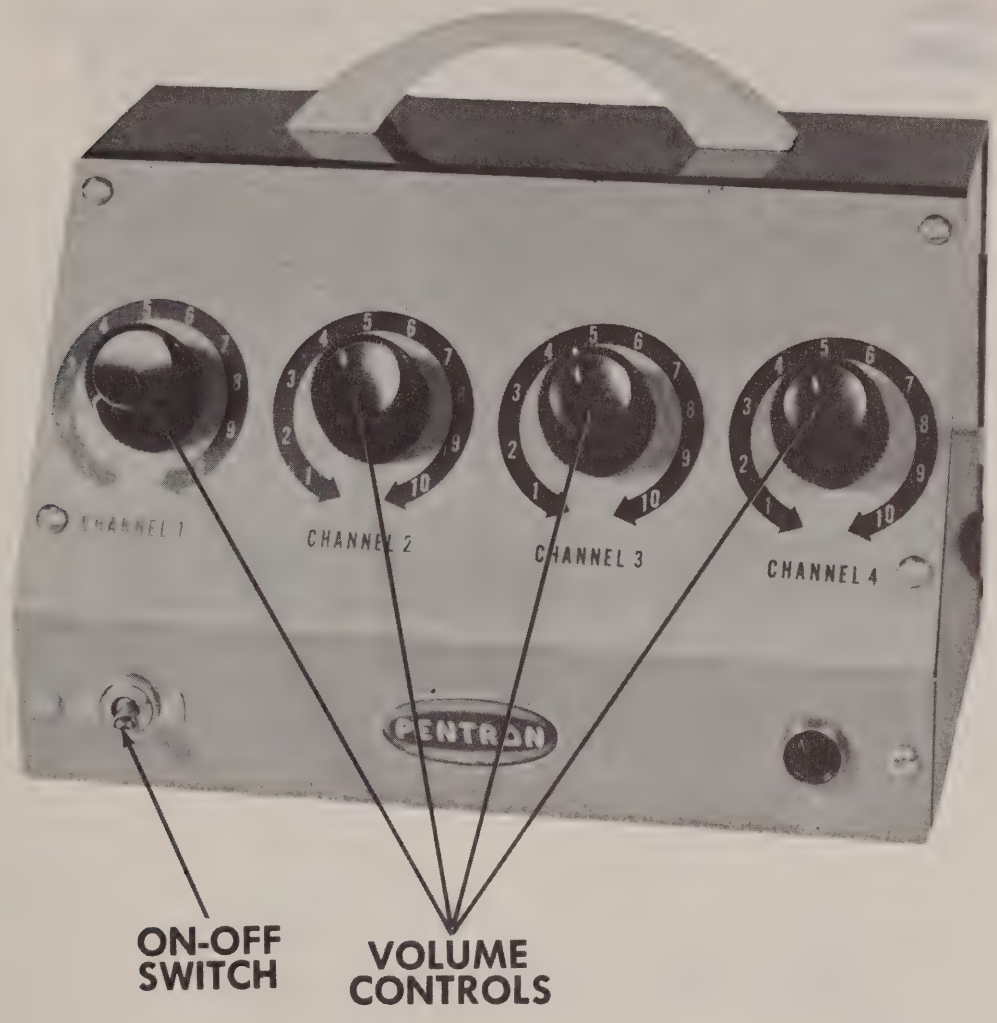
178-7

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PENTRON
MODEL MM4



PENTRON
MODEL MM4

TRADE NAME	Pentron Model MM4
MANUFACTURER	Pentron Corp., 611 W. Division St., Chicago, Ill.
TYPE SET	AC Operated 4 Channel Audio Mixer Pre-amplifier
TUBES (Two)	Types 12AX7 Channels 1 & 2 Pre-amp., 12AX7 Channels 3 & 4 Pre-amp.
POWER SUPPLY	110-120 Volts AC RATING .05 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		PENTRON PART No.	STANDARD REPLACEMENT		
V1	Ch. 1-2 Pre-amp.	12AX7	12AX7	9A	
V2	Ch. 3-4 Pre-amp.	12AX7	12AX7	9A	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	PENTRON PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	▲20			AFH3-05		UP22215		FP311.2	TVL-3433	
B	■20									
C	20									
C2	25	25		PRS25/25		BR252A		TC26	TVA-1205	
C3	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C4	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C5	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C6	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	

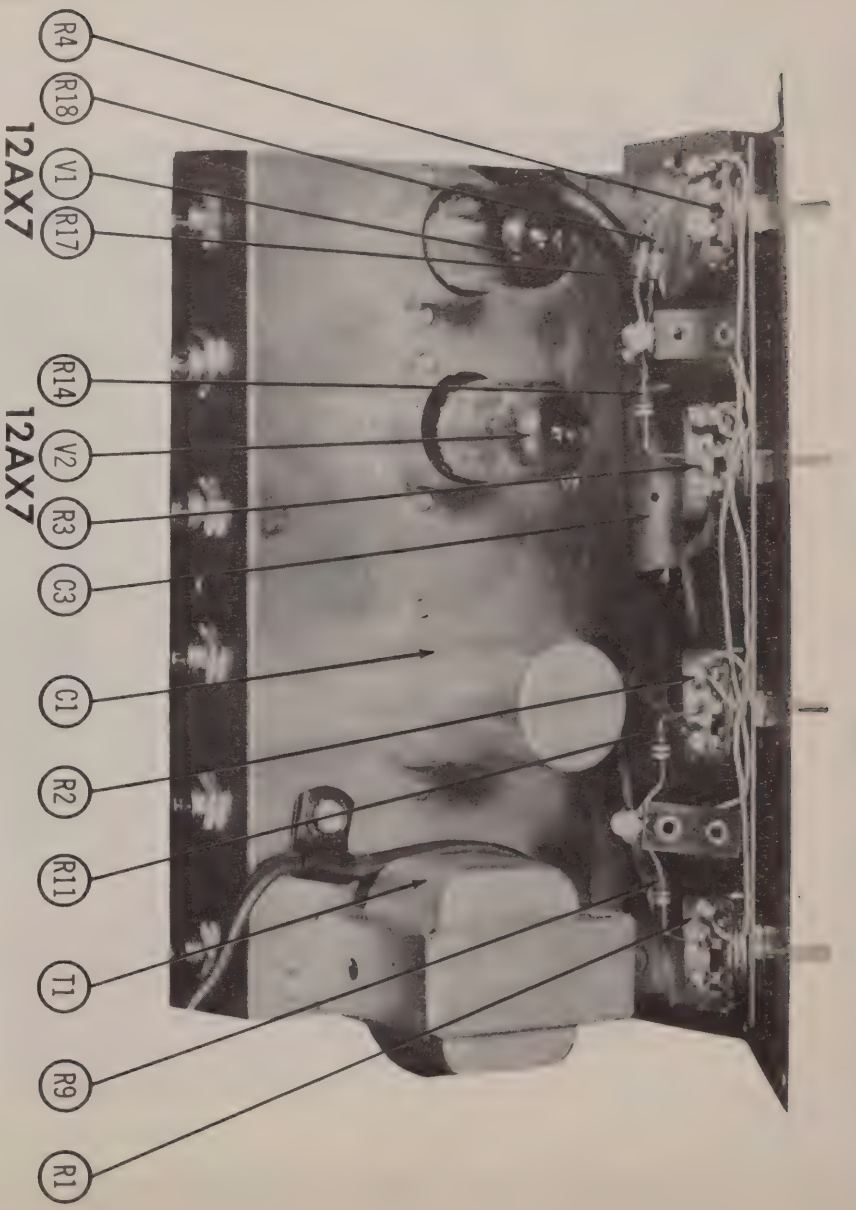
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	PENTRON PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	100KΩ	½	BA011-352	Q13-128	AG-51-Z	AB-41	U-39	Channel 1 Gain
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
R2A	100KΩ	½	BA011-352	Q13-128	AG-51-Z	AB-41	U-39	Channel 2 Gain
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R2A
R3A	100KΩ	½	BA011-352	Q13-128	AG-51-Z	AB-41	U-39	Channel 3 Gain
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R3A
R4A	100KΩ	½	BA011-352	Q13-128	AG-51-Z	AB-41	U-39	Channel 4 Gain
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES	ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATTS	PENTRON PART No.	IRC PART No.			OHMS	WATTS	PART No.	IRC PART No.	
R5	1Meg	½		BTS-1Meg		R13	82KΩ	½		BTS-82K	
R6	1200Ω	½		BTS-1200		R14	330KΩ	½		BTS-330K	
R7	82KΩ	½		BTS-82K		R15	1Meg	½		BTS-1Meg	
R8	1Meg	½		BTS-1Meg		R16	82KΩ	½		BTS-82K	
R9	330KΩ	½		BTS-330K		R17	330KΩ	½		BTS-330K	
R10	82KΩ	½		BTS-82K		R18	100KΩ	½		BTS-100K	
R11	330KΩ	½		BTS-330K		R19	22KΩ	1		BTA-22K	
R12	1Meg	½		BTS-1Meg		R20	15KΩ	2		BTB-15K	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA				
	PRI.	SEC. 1	SEC. 2	SEC. 3	PENTRON PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .05A	115VAC .001ADC	6.3VCT @ .73A		352-18				

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	PENTRON PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.001				1159	8S20 ①	① Solder Rectifier lug to lug in chassis, run wire to other connections.

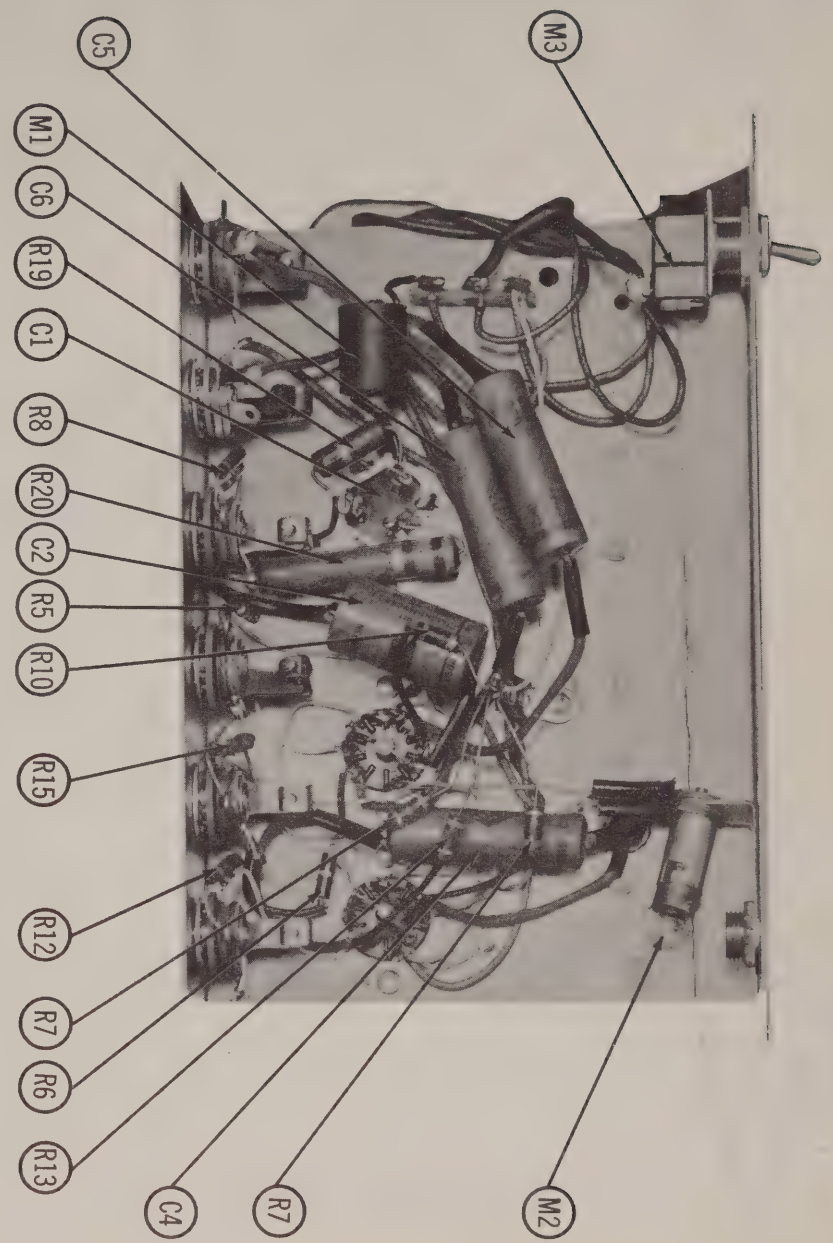
DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					PENTRON PART No.		
M2	Bayonet	6-8	.2	White			Type #51

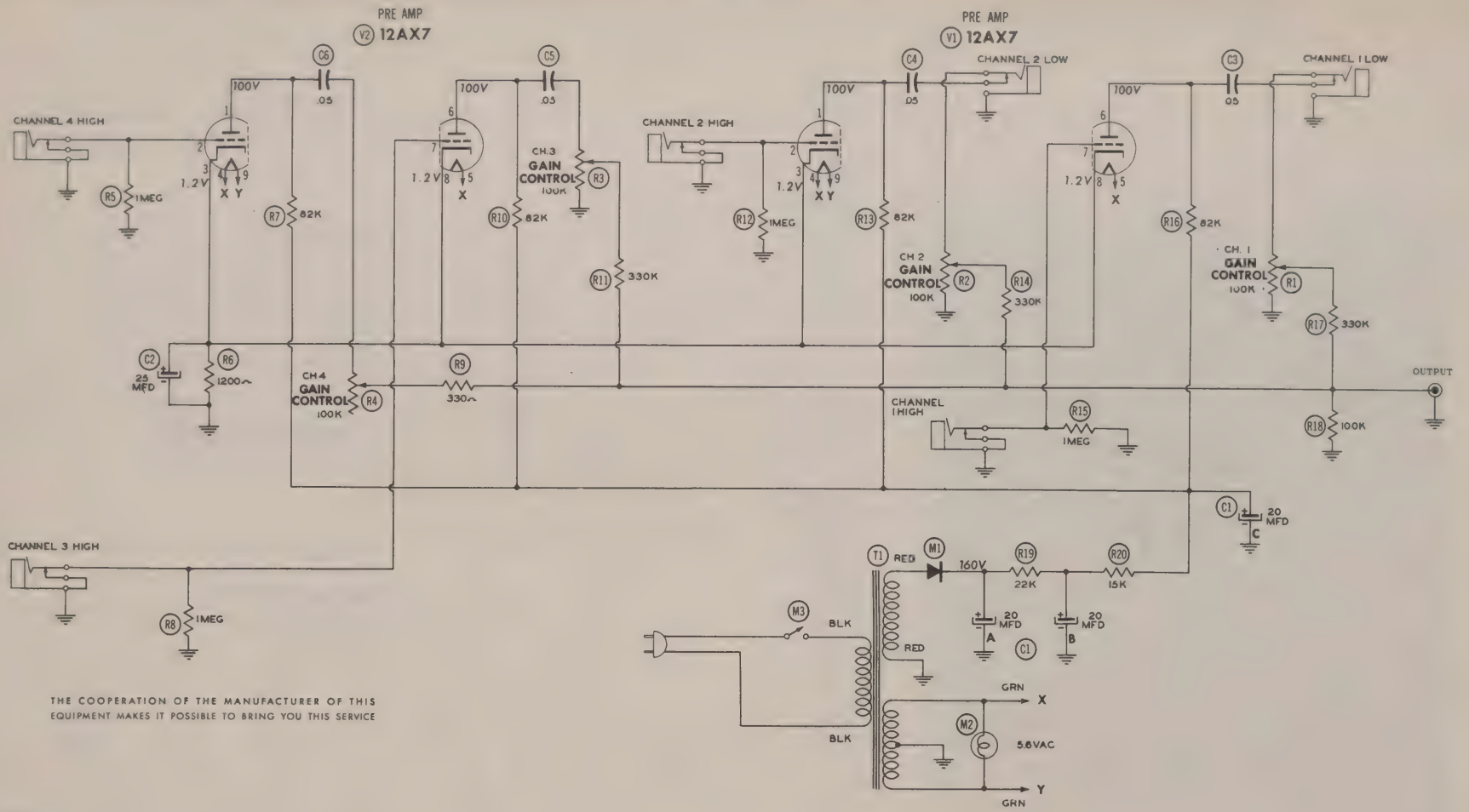
MISCELLANEOUS

ITEM No.	PART NAME	PENTRON PART No.	NOTES
M3	Switch		On/off

CHASSIS—BOTTOM VIEW



PENTRON MODEL MM4



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	12AX7	†119KΩ	0Ω	1.2KΩ	.5Ω	†119KΩ	0Ω	1.2KΩ	.4Ω
V 2	12AX7	†119KΩ	0Ω	1.2KΩ	.5Ω	†119KΩ	0Ω	1.2KΩ	.4Ω

† MEASURED FROM OUTPUT OF M1

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1 - DC Voltage measurements are at 20,000 ohms per volt, AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6 - All controls at minimum, proper output load connected.

PHOTOFACT* Folder

SCOTT
MODEL 820C

DENVER, COLORADO

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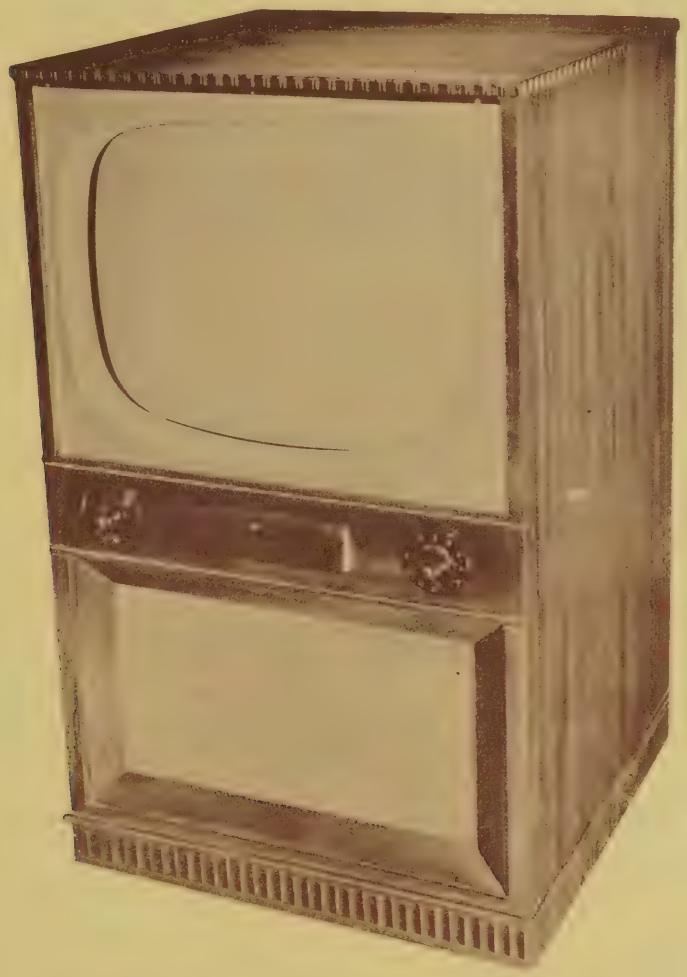

MODEL 820C

SCOTT
MODEL 820C

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SCOTT MODEL 820C

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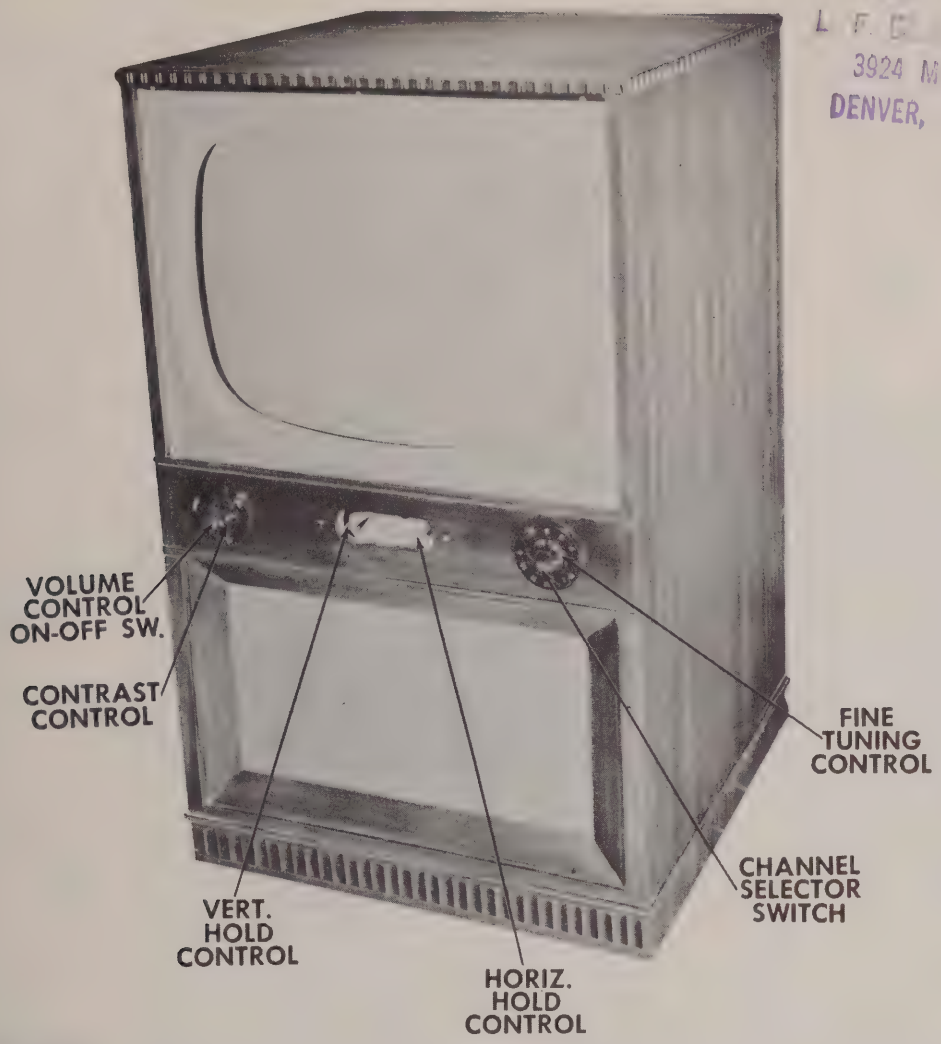

SCOTT MODEL 820C

TRADE NAME	Scott Model 820C
MANUFACTURER	Scott Radio Labs, Inc., 4541 Ravenswood Ave:, Chicago, Ill.
TYPE SET	Television Receiver
TUBES	Twenty

POWER SUPPLY 110-120 Volts AC-60 Cycle RATING 1.64 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST Channels 2 thru 13

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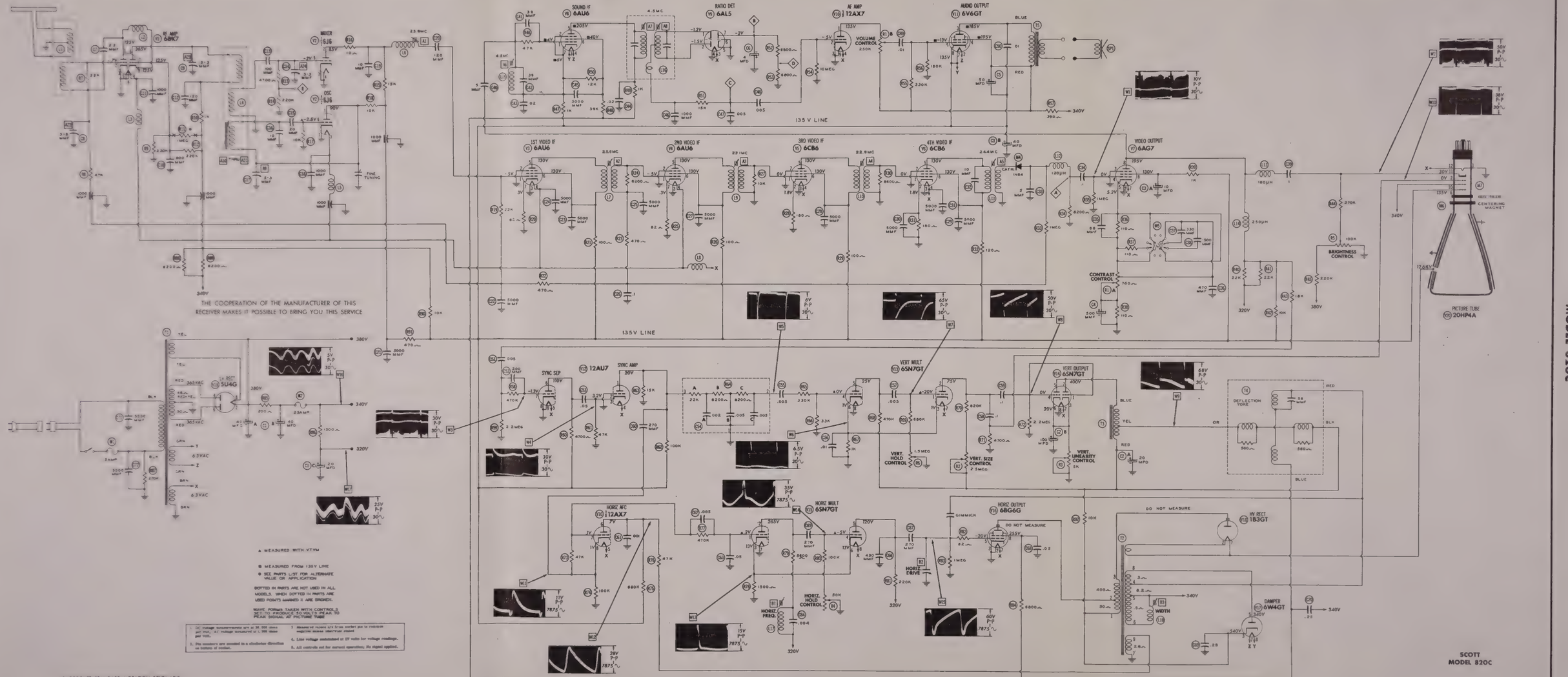

A MEASURED WITH VTVM

B MEASURED FROM 135 V LINE

C SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DOTTED IN PARTS ARE NOT USED IN ALL MODELS. WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE SHOWN.

WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE 30 VOLTS PEAK TO PEAK SIGNAL AT PICTURE TUBE

1. DC voltage measurements are at 20,000 ohms per volt. AC voltage measured at 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction as bottom of socket.
3. Measured values are from socket pin to chassis unless otherwise noted.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; No signal applied.

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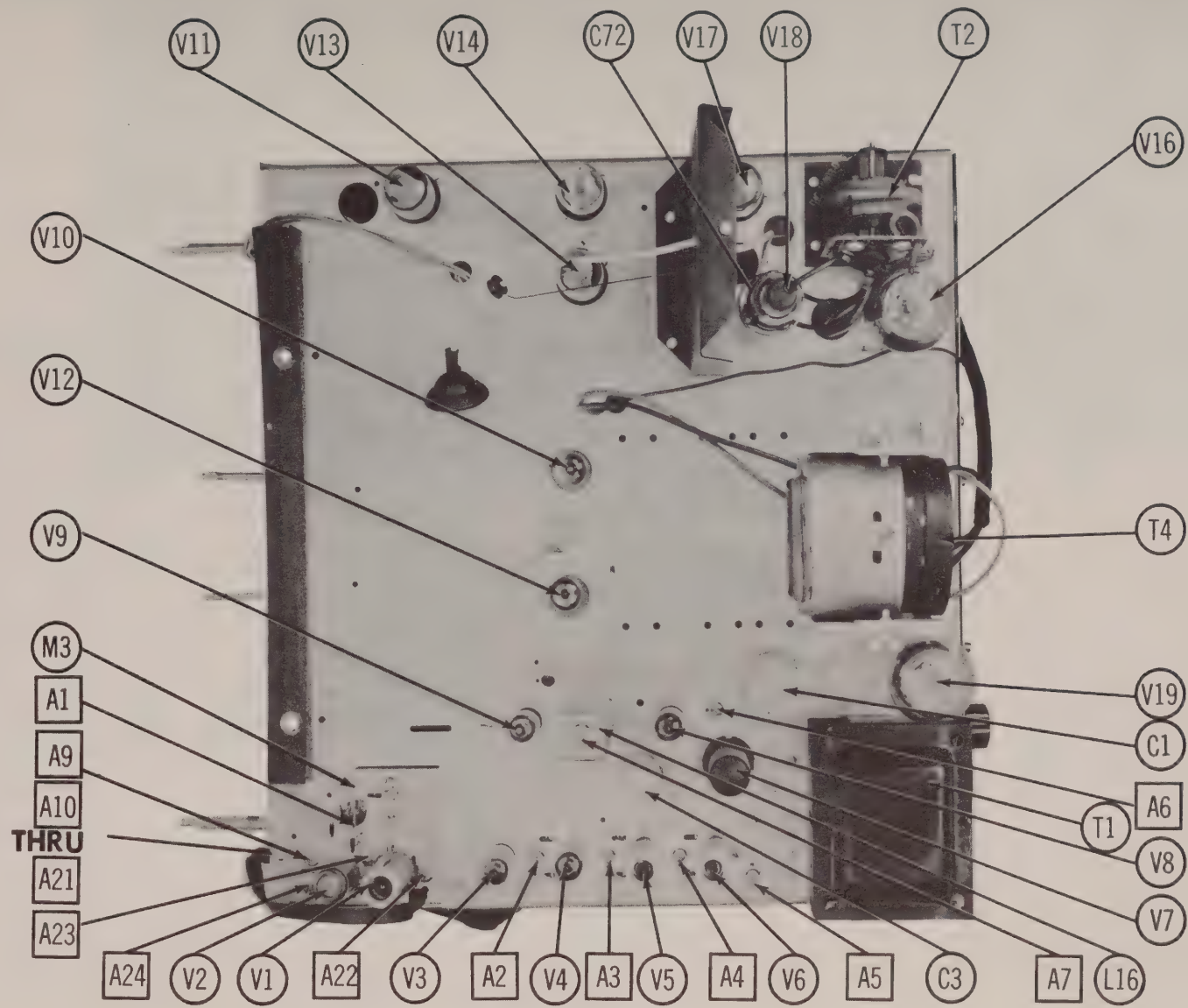
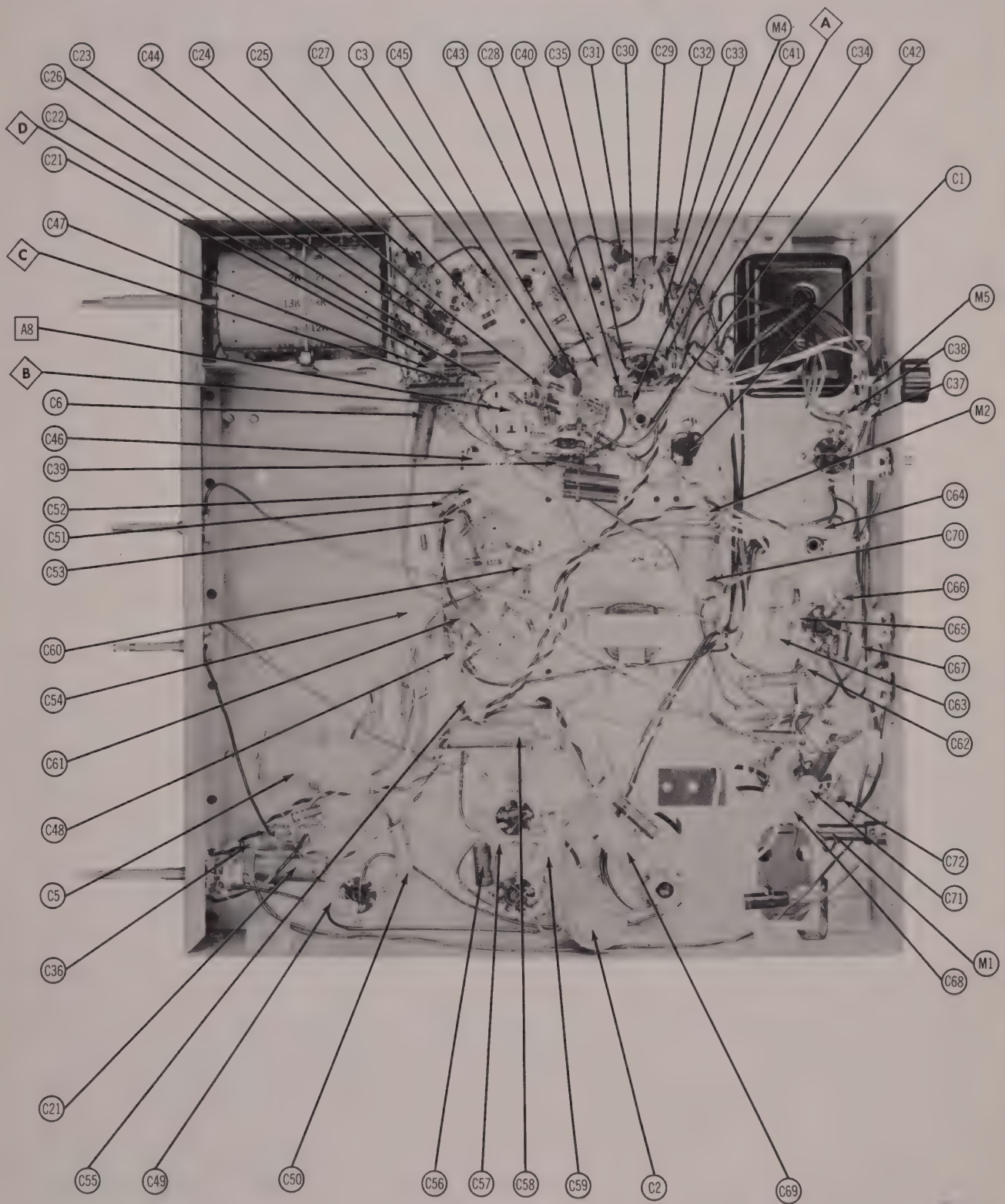
SCOTT MODEL 820C

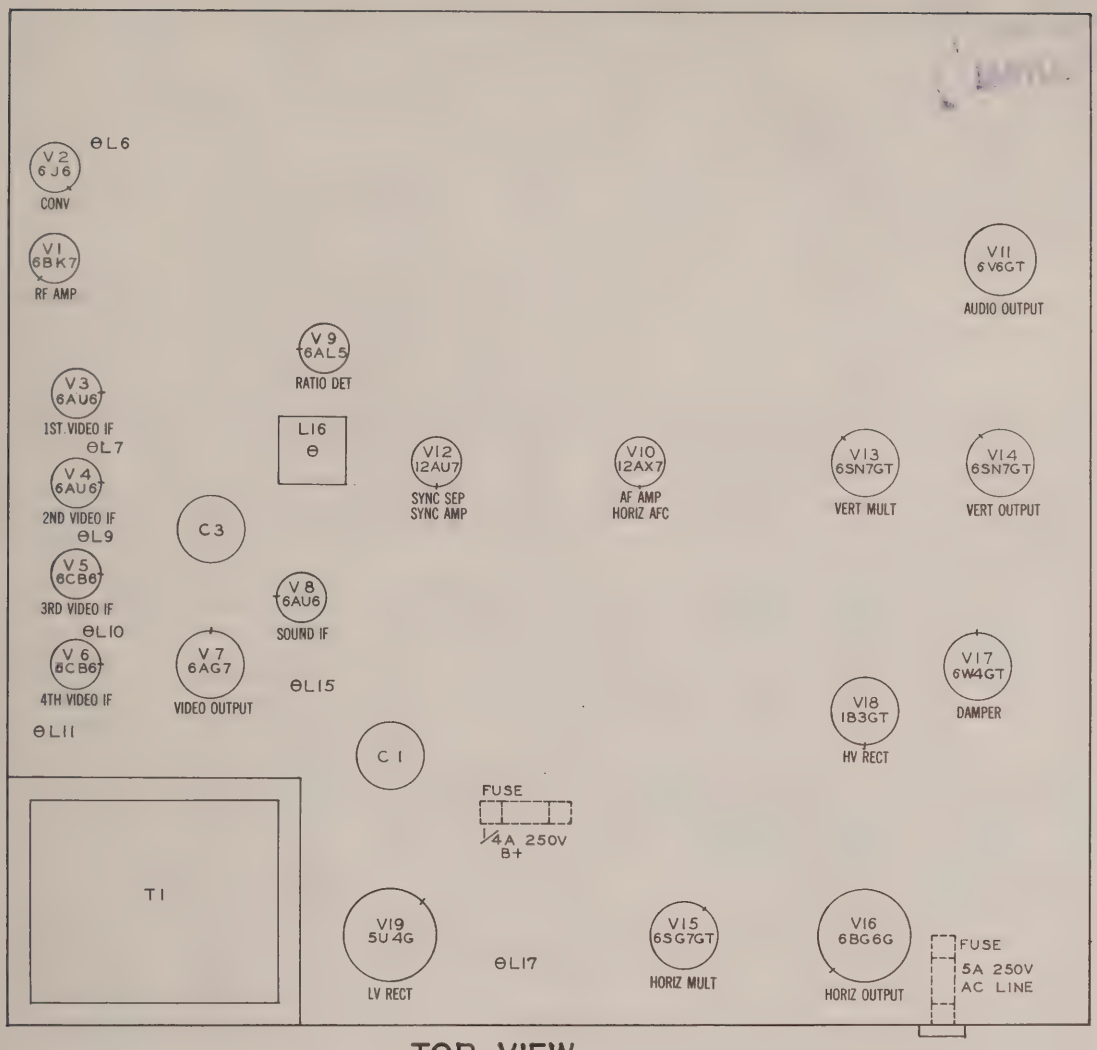


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - V19, Fuse(M1, M2)

LOSS OF PICTURE OR SOUND
No pic., No sound, Has raster-V2, V3, V4, V5, V6, V7, V11
No pic., No sound, Has snow-V1, V2, V3
No pic., Has sound, Has raster- V7, V20
Has pic., No sound- V8, V9, V10, V11

SYNC FAILURE
No Vert. sync. - V12, V13
No Horiz. sync. - V12, V10, V14
No Vert. or Horiz. sync. - V12

SWEEP FAILURE
No raster, has sound- V15, V16, V17, V18, V20
No Vertical deflection- V14
Poor Vert. Linearity or foldover-V13, V14
Poor Horiz. Linearity or foldover-V15, V16, V17
Narrow picture- V15, V16, V17, V19
Vert. off freq. - V12, V13
Horiz. off freq. - V12, V10, V15

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal multivibrator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield flosting over dummy converter tube. Low side to chassis.	25.9MC (Umod.)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for maximum deflection. Attenuate generator to maintain 1 volt reading on VTVM.
2.	"	"	25.6MC	"	"	A2	"
3.	"	"	23.1MC	"	"	A3	"
4.	"	"	22.9MC	"	"	A4	"
5.	"	"	24.4MC	"	"	A5	"

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube. Low side to chassis.	24MC (10MC Swp.)	21.6MC 22.6MC 26.1MC	Any	Vert amp. thru 10KΩ to point (A) Low side to chassis.		Check for response curve as per fig.1 with markers as shown. If necessary retouch A1 thru A5 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.01MFD	High side to point (A) Low side to chassis.	4.5MC (Unmod)	Any	DC probe to point (B) Common to chassis.	A6, A7	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C) Common to point (D)	A8	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.01MFD	High side to point (A). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A6, A7	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as per fig. 2.
8.	"	"	"	"	"	Vert. amp. to point (C) Low side to chassis.	A8	Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A7 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A9. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A9 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just tothe rightof the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213MC (10MC Swp)	211.25MC	13	Vert. amp. thru 10KΩ to point (A). Low side to chassis.	A10	Adjust to place marker at 50% on high frequency side of response curve.
			207MC (10MC Swp)	205.25MC	12		A11	
			201MC (10MC Swp)	199.25MC	11		A12	
			195MC (10MC Swp)	193.25MC	10		A13	
			189MC (10MC Swp)	187.25MC	9		A14	
			183MC (10MC Swp)	181.25MC	8		A15	
			177MC (10MC Swp)	175.25MC	7		A16	
			85MC (10MC Swp)	83.25MC	6		A17	
			79MC (10MC Swp)	77.25MC	5		A18	
			69MC (10MC Swp)	67.25MC	4		A19	
			63MC (10MC Swp)	61.25MC	3		A20	
			57MC (10MC Swp)	55.25MC	2		A21	

ALIGNMENT INSTRUCTIONS (CONT.)

RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
10.	Two 120Ω carbon resistors	Across antenna terminals with 120Ω in each lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert amp. thru 10KΩ to point (E). Low side to chassis.	A22, A23, A24	Adjust for response curve similar to fig. 4 with markers above 90%.
11.	"	"	213MC (10MC Swp)	211.25MC 215.75 MC	13	"		Check for response curve similar to fig. 4. If markers fall below 70% on any channel make slight adjustments of A22, A23 and A24 with channel selector set for that channel. Recheck all channels to see that they have nto been seriouly affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC Swp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

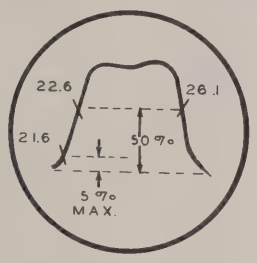


FIG. 1

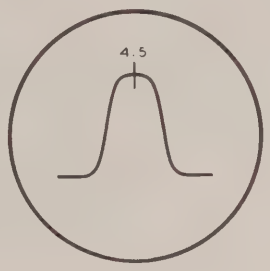


FIG. 2

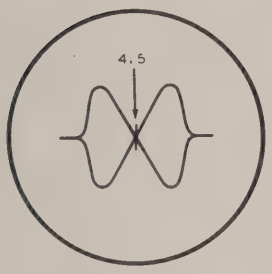


FIG. 3

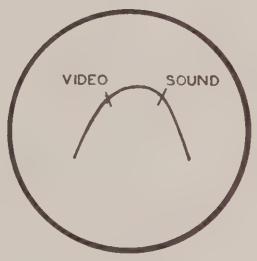
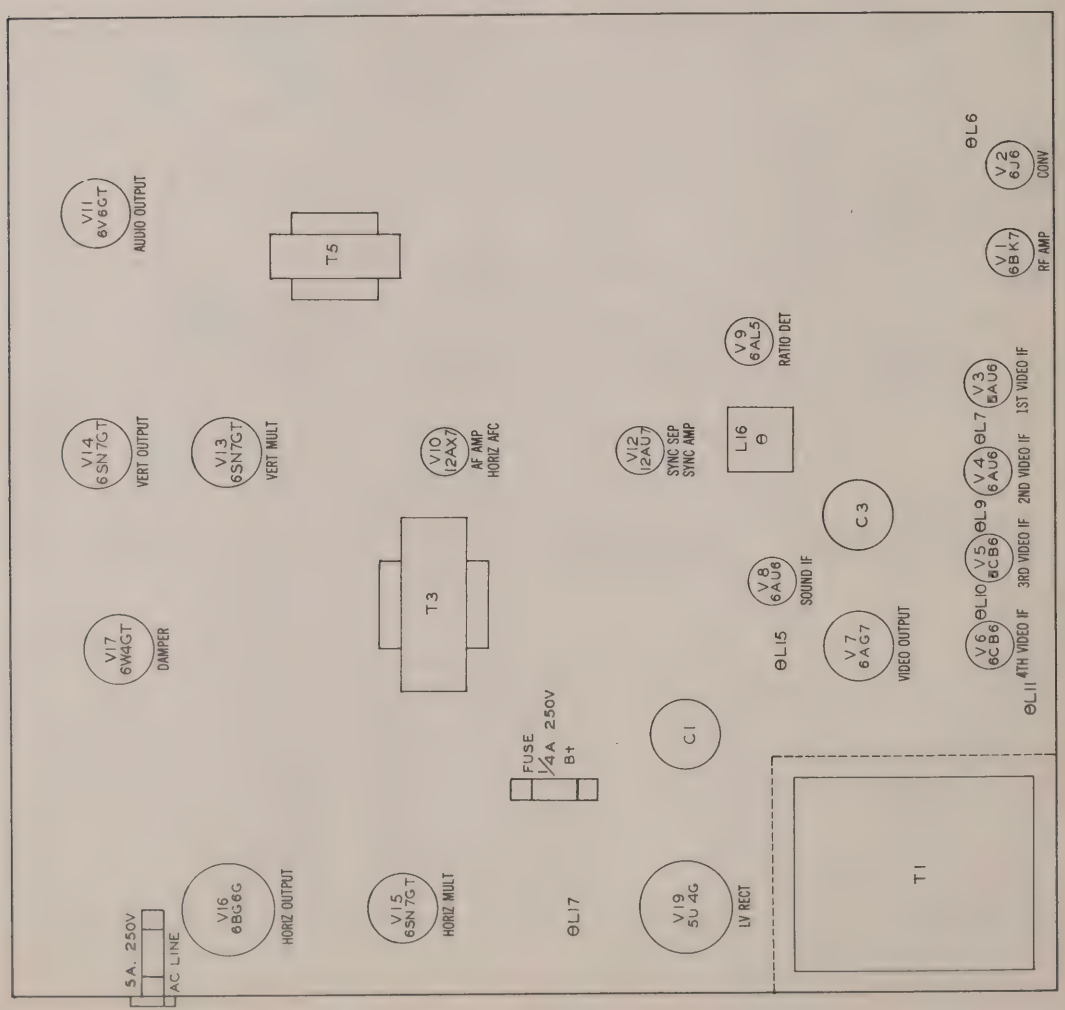


FIG. 4

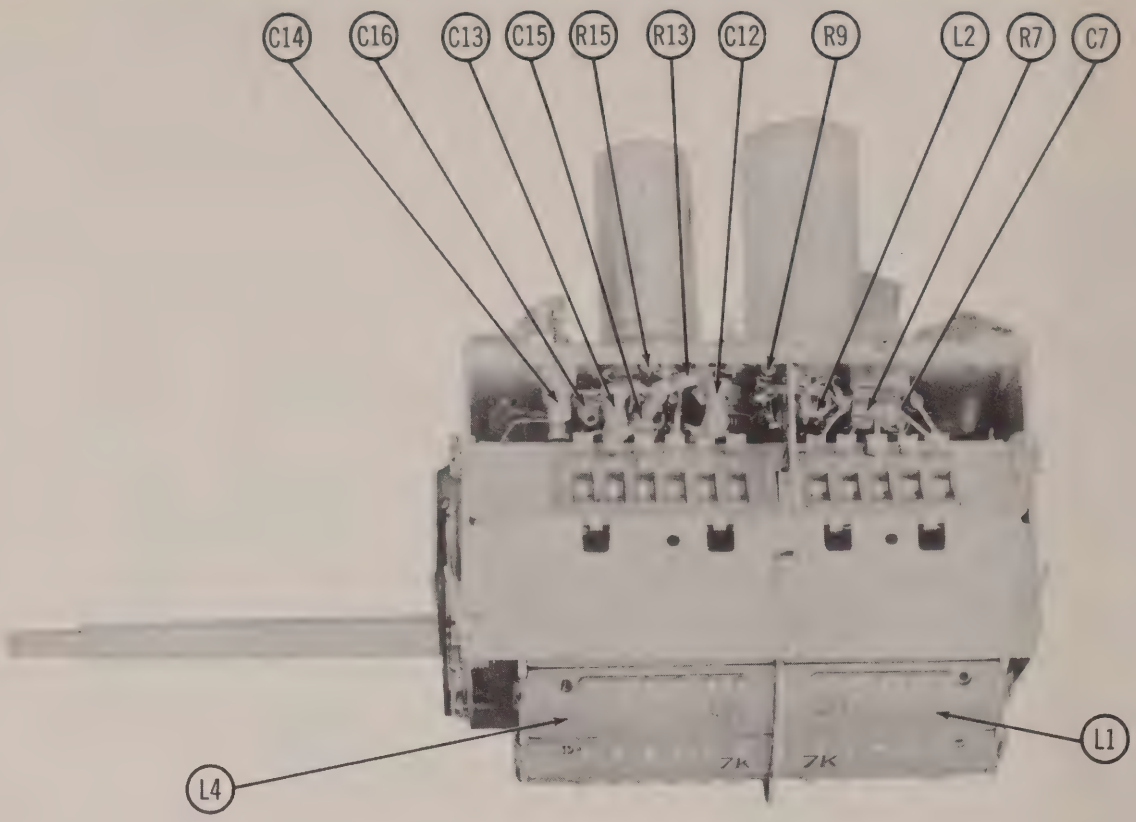
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	1Meg	0Ω	.1Ω	0Ω	†5.3KΩ	110KΩ	INF	0Ω
V 2	6J6	■10KΩ	■15KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6AU6	1Meg	0Ω	0Ω	.1Ω	■100Ω	■100Ω	82Ω		
V 4	6AU6	1Meg	0Ω	0Ω	.1Ω	■100Ω	■100Ω	82Ω		
V 5	6CB6	.1Ω	180Ω	0Ω	.1Ω	■100Ω	■100Ω	0Ω		
V 6	6CB6	.1Ω	180Ω	0Ω	.1Ω	■120Ω	■120Ω	0Ω		
V 7	6AG7	0Ω	0Ω	0Ω	1Meg	500Ω	■1KΩ	.1Ω	■6.8KΩ	
V 8	6AU6	■48KΩ	■1KΩ	■0Ω	■.1Ω	†1.2KΩ	■9KΩ	■1KΩ		
V 9	6AL5	INF	INF	.1Ω	0Ω	0Ω	0Ω	13KΩ		
V 10	12AX7	†250KΩ	10Meg	0Ω	.1Ω	.1Ω	47KΩ	150KΩ	100KΩ	0Ω
V 11	6V6GT	INF	■.1Ω	†835Ω	†590Ω	120KΩ	INF	■0Ω	35KΩ	
V 12	12AU7	15KΩ	0Ω	47KΩ	.1Ω	.1Ω	■4.7KΩ	2.6Meg	0Ω	0Ω
V 13	6SN7GT	1.5Meg	#2Meg	1KΩ	33KΩ	#480KΩ	1KΩ	.1Ω	0Ω	
V 14	6SN7GT	2.2Meg	#11KΩ	1.6KΩ	2.2Meg	#11KΩ	1.6KΩ	.1Ω	0Ω	
V 15	6SN7GT	620KΩ	†7.3KΩ	1.5KΩ	110KΩ	†220KΩ	1.5KΩ	0Ω	.1Ω	
V 16	6BG6G	INF	0Ω	0Ω	INF	1Meg	INF	.1Ω	†7KΩ	TOP CAP #50Ω
V 17	6W4GT	INF	INF	110KΩ	INF	†211Ω	INF	■.1Ω	■0Ω	
V 18	1B3GT	PINS	1 - 8	HAVE	INF	RESISTANCE				TOP CAP #450
V 19	5U4G	INF	50KΩ	INF	46Ω	INF	50Ω	INF	50KΩ	
V 20	20HP4A	0Ω	4.7KΩ	PIN 6 ■0Ω	PIN 10 †200Ω	PIN 11 300KΩ	PIN 12 .1Ω			

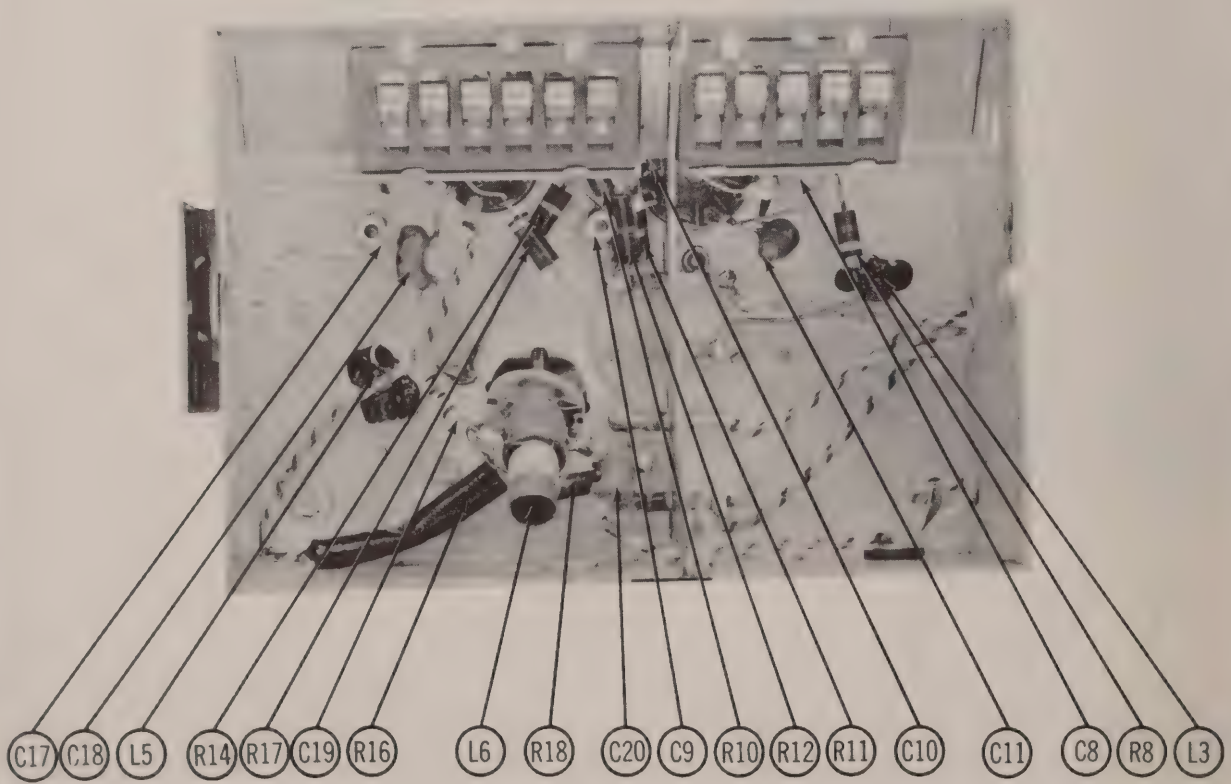
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
HIGHLIGHT SWITCH SET IN "NORMAL" POSITION
† MEASURED FROM PIN 2 of V19.
■ MEASURED FROM 135VDC LINE.



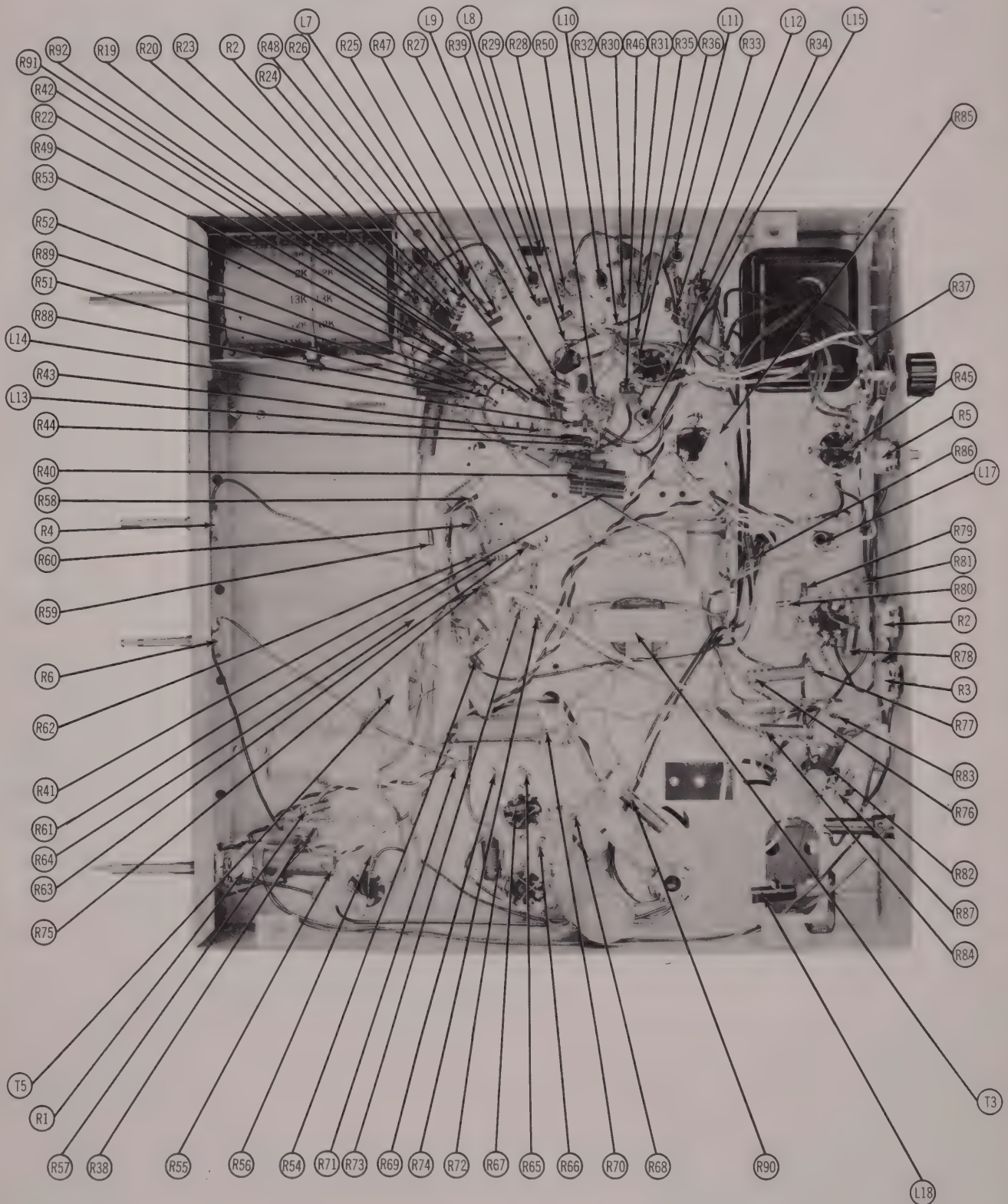
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SCOTT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier		6BK7	9AJ	
V2	Converter	92G3199	6J6	7BF	
V3	1st. Video IF Amp.	92C2659	6AU6	7BK	
V4	2nd. Video IF Amp.	92C2659	6AU6	7BK	
V5	3rd. Video IF Amp.	92X5032	6CB6	7CM	
V6	4th. Video IF Amp.	92X5032	6CB6	7CM	
V7	Video Output	92L2325	6AG7	8Y	
V8	Sound IF Amp.	92C2659	6AU6	7BK	
V9	Ratio Detector		6AL5	6BT	
V10	AF Amplifier-Horiz. AFC		12AX7	9A	
V11	Audio Output	92E1061	6V6GT	7AC	
V12	Sync Separator-Sync Amplifier	92L3501	12AU7	9A	
V13	Vert. Mult.	92A230	6SN7GT	8BD	
V14	Vert. Output	92A230	6SN7GT	8BD	
V15	Horiz. Mult.	92A230	6SN7GT	8BD	
V16	Horiz. Output	92L3266	6BG6G	5BT	
V17	Damper	92W5010	6W4GT	4CG	
V18	HV Rectifier	92G2875	1B3GT	3C	
V19	LV Rectifier	92A234	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SCOTT PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V20	20HP4	20HP4		12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450		AFH3-44		UPT44445		FP447	TVL-3787	
B	▲40	450								
C	■20	450								
C2A	20	450		PRS450/20		BR2045A		TC75	TVA-1709	
B	100	25		PRS25/100		BRH25A		TC250	TVA-1207	
C3A	▲40	250		AFH3-117		UP22135		FP330.7	TVL-1725	
B	▲40	350							TVA-1504	
C4	500	5		PRS6/500		BRH605A		TC605	TVA-1103	
C5	50	350		PRS450/40		BR4035		TC68	TVA-1613	
C6	4	50		PRS150/4		BR550		TC30	TVA-1303	
C7	2.2				TCZ-2.2		NP0K-2R2		5TCCB-V22	
C8	3-8				829-10					
C9	.5-3				829-3			CT565A		
C10	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C11	1000			SII000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C12	120			SII20	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C13	100			SII00	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C14	.5-3				829-3			CT565A		
C15	20			SI20NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C16	10			SII0N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C17	.5-3				829-3			CT565A		
C18	1000			SII000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C19	10			SII0NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C20	120			SII20	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C21	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C22	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C23	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C24	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C25	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C26	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C27	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C30	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C31	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C32	10			SII0	D6-100	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C33	5			SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555	5TCUB-V5	
C34	.1	200		P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C35	68			SI68	D6-680	5W5Q7	GP1K-680	UC-5468	5GA-Q68	
C36	470			SI470	D6-471	5W5T5	GP2K-471	UC-5347	5GA-T47	
C37	330	500		1469-00035						
C38	1500			SII500	D6-152	TM5D15	GP2L-152	UC-5215	5HK-D15	
C39	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C40	5			SI5	TCZ-4.7	5W5V5	GP1K-050	ZT-555	5TCUB-V5	
C41	39	500		1468-00004	D6-390	5W5Q4	GP1K-390	MC223	1FM-44	
C42	39	500		1468-00004	D6-390	5W5Q4	GP1K-390	MC223	1FM-44	
C43	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C44	.02	600		P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C45	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	1000			SII000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C47	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C48	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C49	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C50	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C51	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C52	200			SI200	D6-201	TM5T2	GP2K-201	UC-532	5GA-T2	
C53	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C54A	.002			P688-002		PTE6D2		PT622		
B	.005			P688-005	◆PC-100	PTE6D5	◆1405-01	PT625	◆101C1	
C	.005			P688-005		PTE6D5		PT625		
C55	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C56	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C57	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C58	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C59	.1	600		P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C60	270	500		1469-0003	D6-271	5R5T3	GP2K-271	MCB241	MS-33	
C61	.001	400		P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C62	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C63	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SCOTT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C64	.004	400		1464-004		1DR5D4		MCB463		
C65	270	500		1469-0003		5R5T3		MCB241	MS-33	
C66	430	500								
C67	270	500		1469-0003	D6-271	5R5T3	GP2K-271	MCB241	MS-33	
C68	.05	600		P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C69	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C70	.25	600		684-25		PTE6P25		PT6025	6TM-P25	
C71	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C72	5000			BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	

◆ Items C54A, C54B, C54C, R64A, R64B, R64C are combined in one unit.

CONTROLS

ITEM No	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SCOTT PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	750Ω	1/2	VC-12127B	QJ-246*	RTV-297	SBB-682-S	WF13-T251	Contrast-Tapped @ 500Ω-Panel
B	250KΩ	1/2					UR254A	Volume - Rear
C	Switch						US-26	Attach to R1B
R2A	2.5Meg	1/2	VC-12121C	QH-239	AG-84-S	AB-83	SU-565	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	5000Ω	1/2	VC-12120B	QH-114	AG-19-S	AB-10	SU-14	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R3A
R4A	50KΩ	1/2	VC-12131	QH-123	AG-44-S	AB-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R4A
R5A	100KΩ	1/2	VC-12135	QH-128	AG-49-S	AB-40	SU-41	Brightness
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1.5Meg	1/2	VC-12132D	QH-138	AG-83-S	AB-75	U-155	Vert. Hold
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R6A

* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B17-105X & P1-210 (Panel), B13-130 & R2-226 (Rear) & SWITCH 76-1

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: SCOTT PART No.	IRC PART No.	NOTES	ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: SCOTT PART No.	IRC PART No.	NOTES
R7	22KΩ	1				R51	15KΩ	1		BTS-15K	
R8	47KΩ	1				R52	6800Ω 10%	1		BTS-6800	
R9	220KΩ	1		BTS-220K		R53	6800Ω 10 %	1		BTS-6800	
R10	1000Ω	1		BTS-1000		R54	10Meg	1		BTS-10Meg	
R11	1Meg	1			Note	R55	3.0KΩ 5%	1		BTS-330K 5%	
R12	220KΩ	1		BTS-220K		R56	180KΩ 5%	1		BTS-180K 5%	
R13	4700Ω 10%	1		BTS-4700		R57	390Ω	1		BTA-390	
R14	220KΩ	1		BTS-220K		R58	470KΩ	1		BTS-470K	
R15	15KΩ	1				R59	2.2Meg	1		BTS-2.2Meg	
R16	10Ω 10%	1				R60	4700Ω	1		BTS-4700	
R17	10KΩ	1				R61	47KΩ	1		BTS-47K	
R18	10KΩ 10%	1				R62	100KΩ	1		BTS-100K	
R19	22KΩ10%	1		BTS-22K		R63	15KΩ	1		BTS-15K	
R20	82Ω	1		BTS-82		R64A	22KΩ 10%	1		BTS-22K	
R21	100Ω	1		BTS-100		B	8200Ω 10%	1	◆	BTS-8200	
R22	470Ω	1		BTS-470		C	8200Ω 10%	1		BTS-8200	
R23	470Ω 10%	2		BTB-470		R65	330KΩ	1		BTS-330K	
R24	8200Ω 10%	1				R66	33KΩ	1		BTS-33K	
R25	82Ω 10%	1		BTS-82		R67	1000Ω	1		BTS-1000	
R26	100Ω	1		BTS-100		R68	470KΩ	1		BTS-470K	
R27	10KΩ 10%	1				R69	680KΩ	1		BTS-680K	
R28	180Ω	1		BTS-180		R70	820KΩ	1		BTS-820K	
R29	100Ω	1		BTS-100		R71	4700Ω	1		BTS-4700	
R30	6800Ω 10%	1				R72	2.2Meg	1		BTS-2.2Meg	
R31	180Ω	1		BTS-180		R73	47KΩ	1		BTS-47K	
R32	120Ω 10%	1		BTS-120		R74	100KΩ	1		BTS-100K	
R33	1Meg	1		BTS-1Meg		R75	680KΩ	1		BTS-680K	
R34	8200Ω 10%	1		BTS-8200		R76	47KΩ	2		BTB-47K	
R35	1Meg	1		BTS-1Meg		R77	470KΩ	1		BTS-470K	
R36	110Ω 5%	1		BTS-110 5%		R78	1500Ω 10%	1		BTS-1500	
R37	110Ω 5%	1		BTS-110 5%		R79	5600Ω	1		BTS-5600	
R38	110Ω 5%	1		BTS-110 5%		R80	100KΩ	1		BTS-100K	
R39	1000Ω	2		BTS-1000		R81	220KΩ 10%	2		BTS-220K	
R40	22KΩ	2		BTS-22K		R82	82Ω	2			
R41	22KΩ	2		BTB-22K		R83	1Meg	1		BTS-1Meg	
R42	10KΩ 10%	1		BTS-10K		R84	6800Ω	2		BTB-6800	
R43	18KΩ 10%	1		BTS-18K		R85	200Ω 10%	10		1 3/4A-200	
R44	270KΩ10%	1		BTS-270K		R86	1500Ω	1		BTA-1500	
R45	220KΩ	1		BTS-220K		R87	270KΩ	1		BTA-270K	
R46	47KΩ	1				R88	8200Ω	2		BTB-8200	
R47	1000Ω 10%	1/2		BTS-1000		R89	8200Ω	2		BTB-8200	
R48	39KΩ	1		BTA-39K		R90	10KΩ	2		BTB-10K	
R49	1000Ω	1/2		BTS-1000		R91	470Ω	2		BTB-470	
R50	12KΩ	1/2		BTS-12K		R92	10KΩ	2		BTB-10K	

Note: Not used in all models.
◆ Items R64A, R64B, R64C, C54A, C54B, C54C are con bined in one unit.
All resistors ± 20% unless otherwise noted.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SCOTT PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	10"	PM	3.4Ω	SR-10024	ST-119 Mod. P10-T	10J11	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SCOTT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC ② 1.84A	730VCT .180ADC	5VAC ③ 3A	6.3VAC ④ 6.3A SEC. 4 8.3VAC ⑤ 1.88A	TPC-10011	P-8165	P-3059	TP-368 ①	R-37BC

① Drill new mtg. holes.

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SCOTT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	450Ω Tap ③ 50Ω	11.7Ω Tap ④ .5Ω, 8.7Ω SEC. 2 2.8Ω SEC. 3 0Ω	THC-10003-D		HVO-1 ①		DIB-3827	Horiz. Output Trans.
T3	970Ω tap ⑤ 12Ω	17Ω		A-8123	A-3037	TSO-8	A-102X	Vert. Output Trans.
T4A	65Ω		4DB-10001A	DY-8	MDF-70	TY-2	Y-12	Horiz. Deflection Coils
B								Vert. Deflection Coils

① Use with MWC-2

MERCHANDISE MART DENVER, COLORADO

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SCOTT PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T5	5.8KΩ	3.4Ω	247Ω	5Ω	TOC-10034	A-3877 ①	A-2930 ①	RO-301 ①	S-3X ①	① Drill one new mtg. hole.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: SCOTT PART No.	REPLACEMENT DATA: MERIT PART No.	NOTES
L1	Ant. Coils	0Ω				
L2	RF Choke	0Ω				
L3	Fil. Choke	0Ω				
L4	RF, Mixer Grid & Osc. Coils	0Ω				
L5	Fil. Choke	0Ω				
L6	1st Video IF	.6Ω				
L7	2nd. Video IF	.1Ω	.1Ω			
L8	Fil. Choke	0Ω				
L9	3rd. Video IF	.1Ω	.1Ω			
L10	4th. Video IF	.1Ω	.1Ω			
L11	5th. Video IF	.1Ω	.1Ω			
L12	Peaking Coil	7.5Ω				120 Microhenries
L13	Peaking Coil	11Ω			TV-184	180 Microhenries
L14	Peaking Coil	12.2Ω			TV-185	250 Microhenries
L15	Sound IF	2.3Ω			TV-151	
L16	Ratio Det.	4Ω	.1Ω CT		TV-110	Tertiary Winding .6Ω
L17	Horiz. Osc.	60Ω			TV-183	
L18	Width Coil	.4Ω				

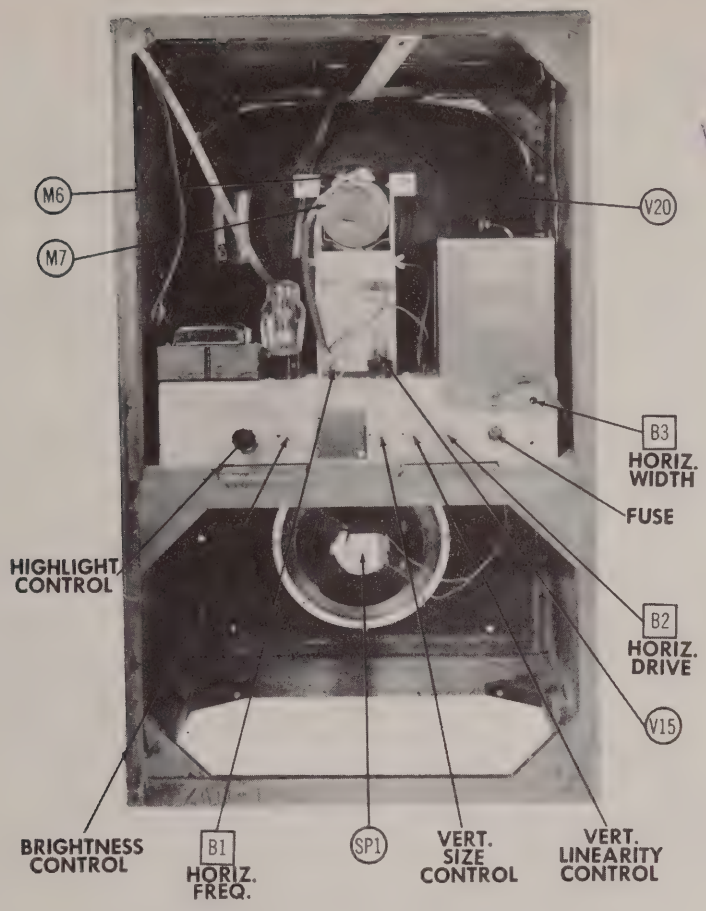
FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA: SCOTT PART No. FUSE	SCOTT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M1	3AG	5A 250V.			312005	341001	MTH5	HKP
M2	3AG	1/4 A. 250V.			318.250		GJV 1/4A.	

MISCELLANEOUS

ITEM No.	PART NAME	SCOTT PART No.	NOTES
M3	RF Tuner		Standard Coil
M4	Crystal		1N64
M5	Switch		Highlight Control
M6	Centering Magnet		
M7	Ion Trap		
B2	Trimmer		Horiz. Drive

SCOTT MODEL 820C



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Adjust the horizontal drive trimmer (B2) to its maximum counter clockwise position without the presence of a vertical white line in the picture.

Adjust the width slug (B3) for a picture slightly wider than enough to fill the picture mask horizontally.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 7 wood screws. Remove rear cover.
3. Disconnect built in antenna and speaker Remove 2 wood screws. Remove antenna bracket.
4. Remove 1 wood screw loosening Crt. brace.
5. Remove 2 speaker nuts. Remove speaker.
6. Remove 4 chassis bolts. Remove chassis.

NOTE
FOR REMOVAL OF PICTURE TUBE IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PHOTOFACT* Folder

SENTINEL MODELS 1U-447A, 1U-448A, 1U-449A, 1U450A, 1U-451A

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MODEL 1U-449A

SENTINEL MODELS 1U-447A, 1U-448A, 1U-449A, 1U450A, 1U-451A

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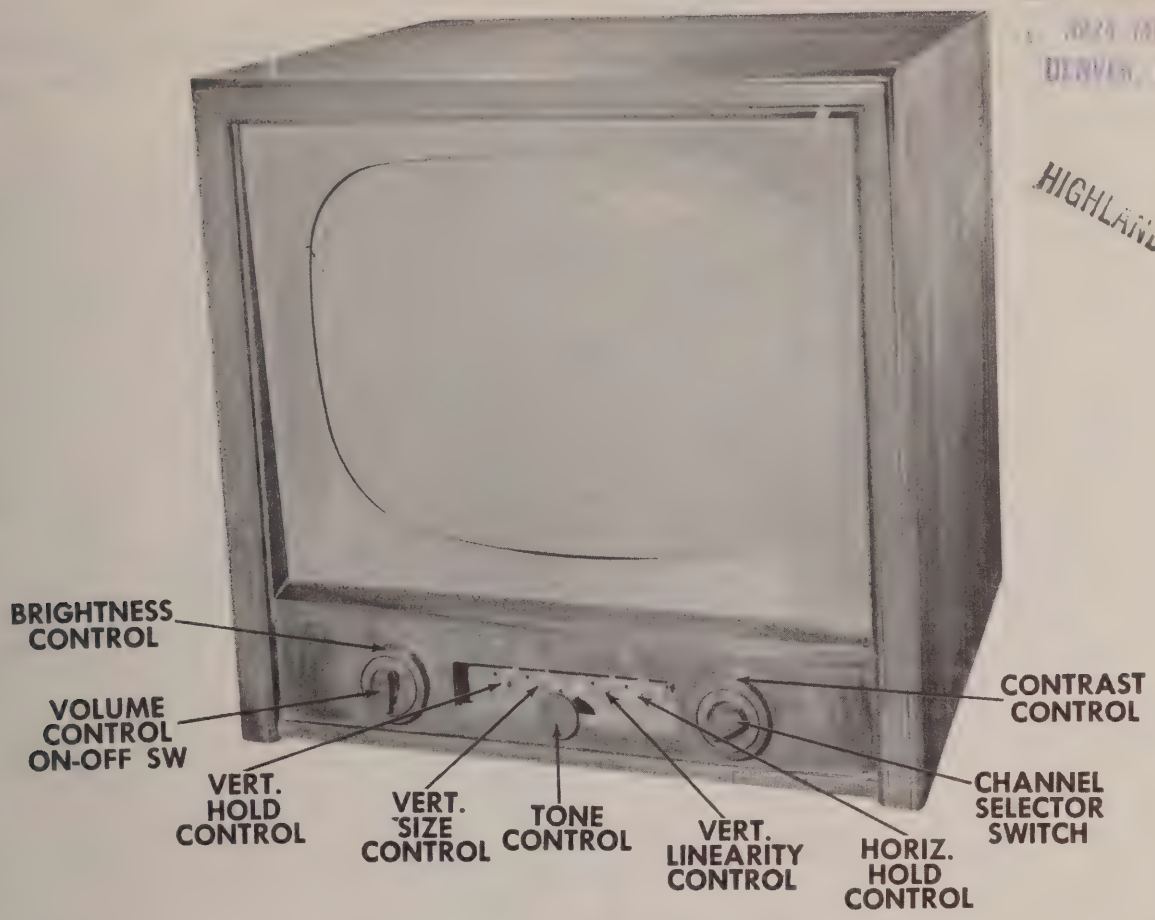
DATE 9-52 SET 178 FOLDER 10

SENTINEL MODELS 1U-447A, 1U-448A, 1U-449A, 1U450A, 1U-451A

HIGHLAND RADIO SERVICE



SENTINEL MODELS 1U-447A, 1U-448A, 1U-449A, 1U450A, 1U-451A

SENTINEL 1U-449-A

TRADE NAME	Sentinel Models 1U-447-A, 1U-448-A, 1U-449-A, 1U-450-A, 1U-451-A
MANUFACTURER	Sentinel Radio Corp., 2100 W. Dempster, Evanston, Ill.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC -60 Cycle
RATING	1.88 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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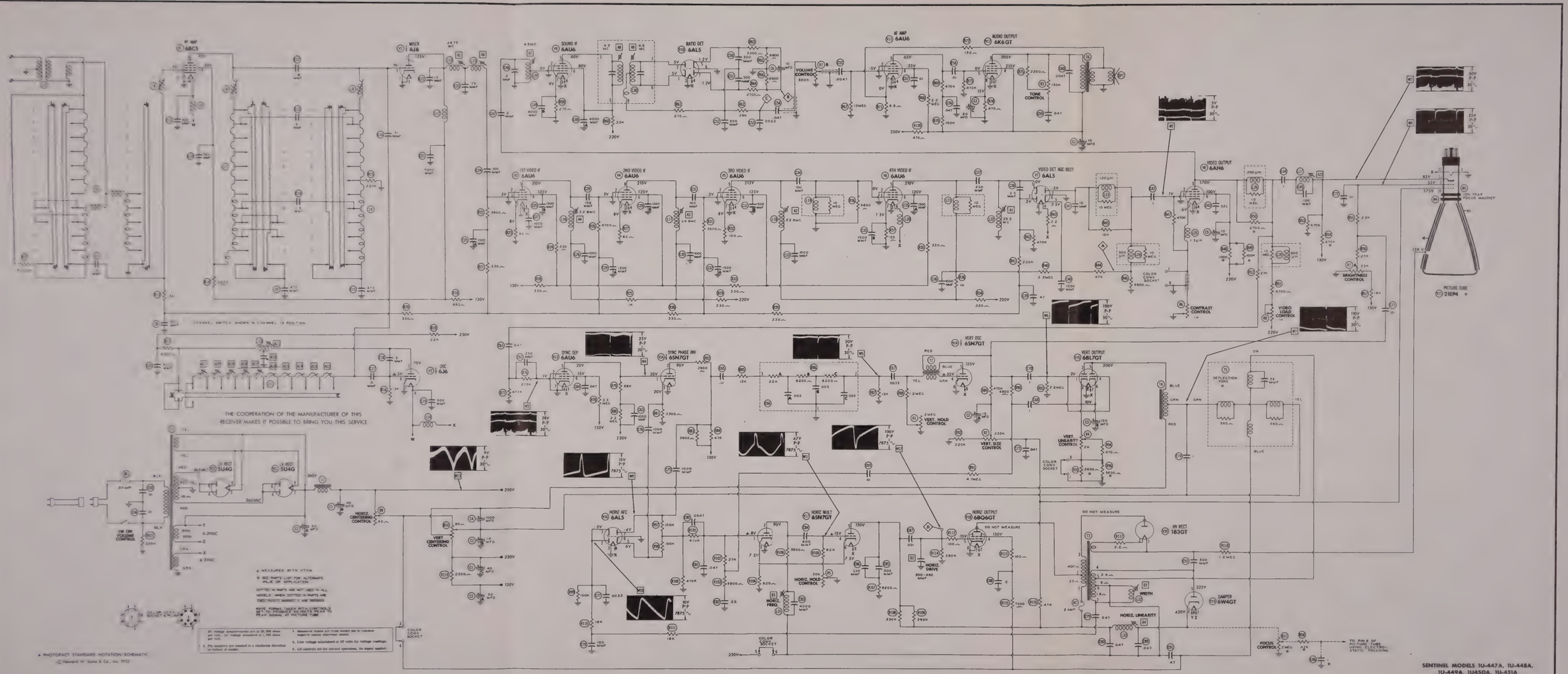
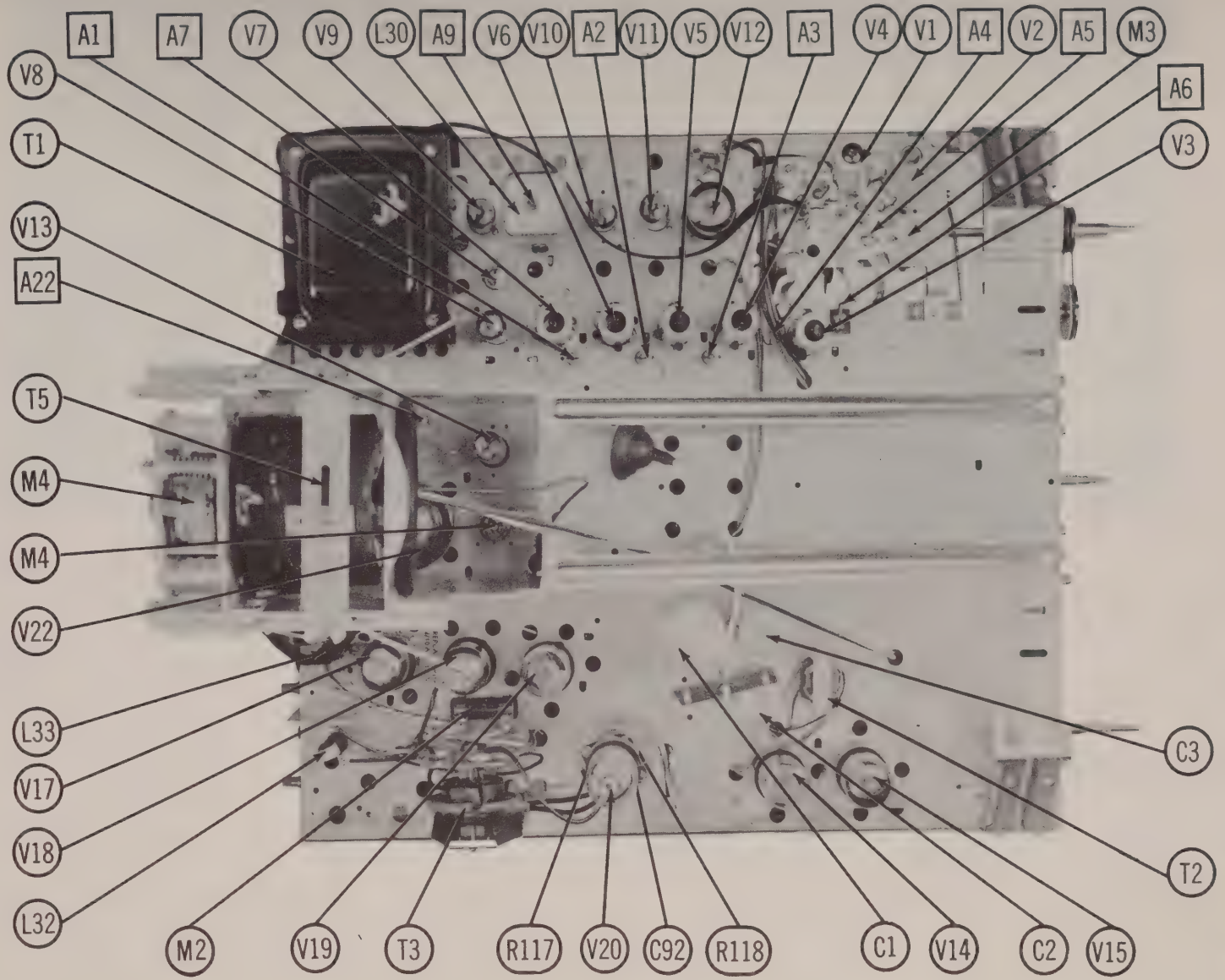
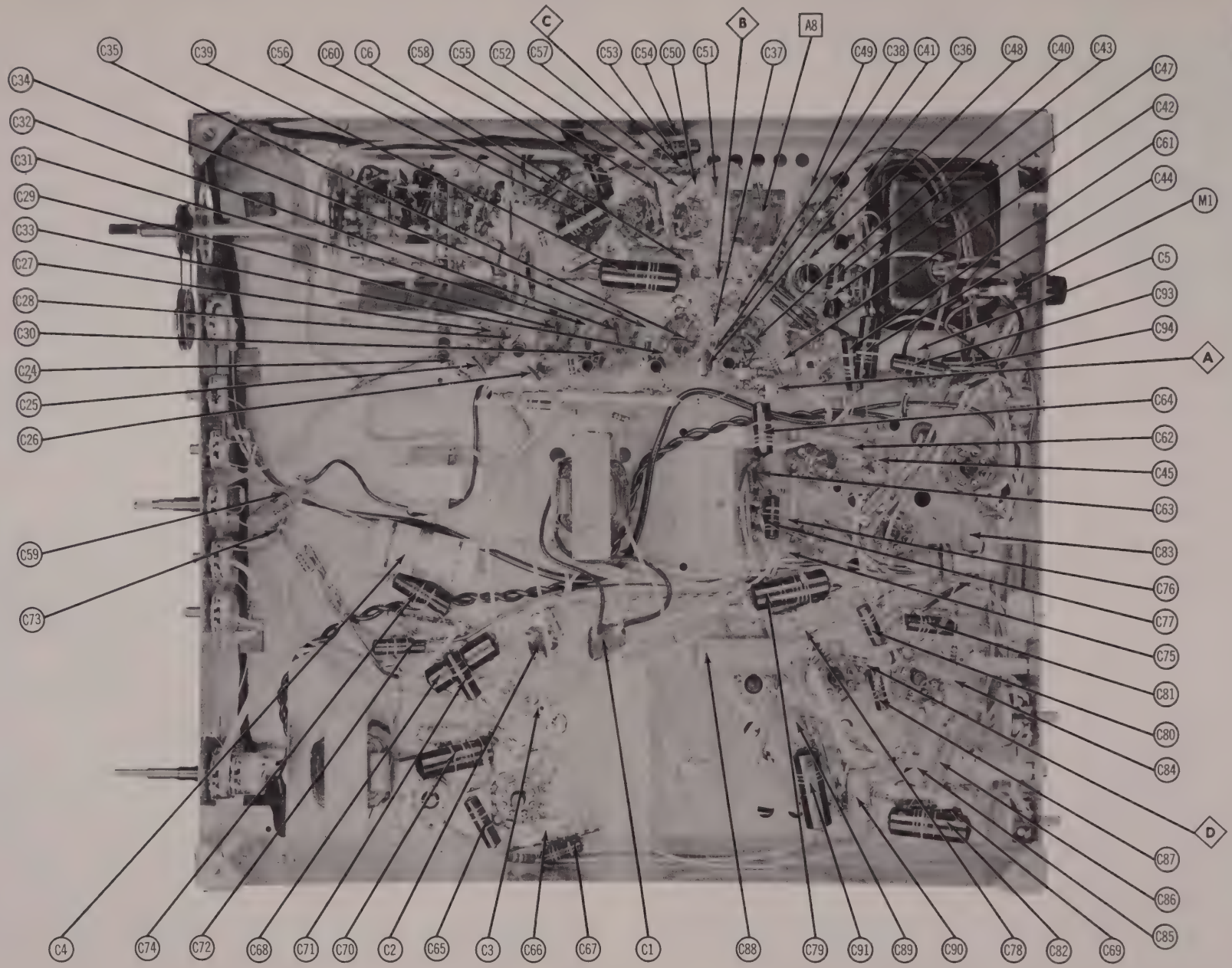

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A PHOTOFACT STANDARD NOTATION SCHEMATIC
SENTINEL MODELS 1U-447A, 1U-448A, 1U-449A, 1U-450A, 1U-451A

SENTINEL MODELS 1U-447A, 1U-448A, 1U-449A, 1U-450A, 1U-451A

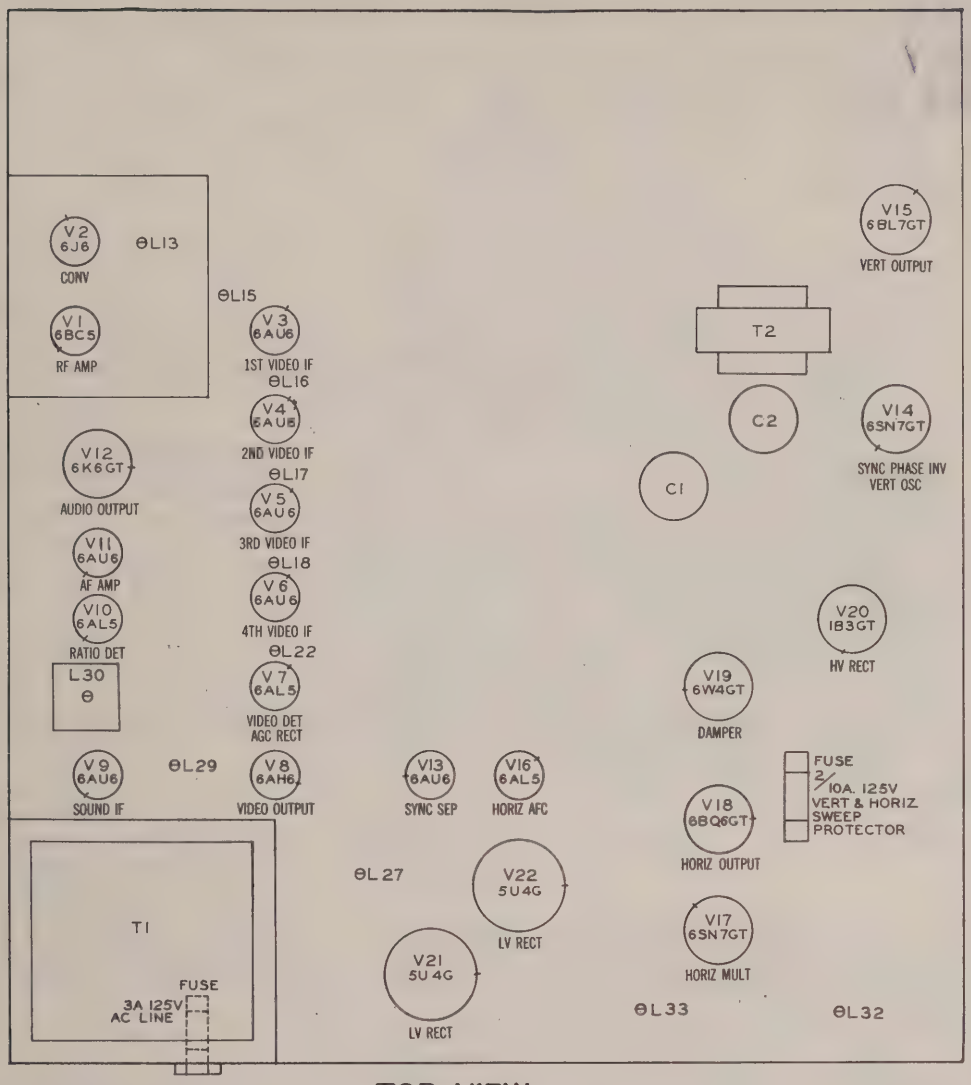


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound -V21, V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3, V4, V5, V6, V7, V8
No Pic, No Sound, Has Snow - V1, V2, V3
No Pic, Has Sound, Has Raster - V8, V23
Has Pic, No Sound - V9, V10, V11, V12
Overloaded Picture - V7

SYNC FAILURE
No Vert. Sync - V14
No Horiz. Sync - V14, V16, V17
No Vert. or Horiz. Sync - V13, V14

SWEEP FAILURE
No Raster, Has Sound - V17, V18, V19, V20, V23 , Fuse (M2)
No Vertical Deflection - V15
Poor Vert. Linearity or Foldover - V14, V15
Poor Horiz. Linearity or Foldover - V17, V18, V19
Narrow Picture - V17, V18, V19, V21, V22
Vert. Off Freq. - V14
Horiz. Off Freq. - V14, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage lead should be securely taped and kept away from the chassis. Do not remove the horizontal oscillator tube to disable the high voltage.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, from its socket and replace with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C39. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded tube shield floating over dummy converter tube, (V2). Low side to chassis.	25.5MC (Unmod.)	Any	DC probe to point (A). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	22.8MC	"	"	A2	"
3.	"	"	24.6MC	"	"	A3	"
4.	"	"	22.8MC	"	"	A4	"
5.	"	"	24.75MC	"	"	A5	Detune L15 by turning A6 into center of coil, then adjust A5 for maximum deflection.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side to chassis.	24MC (10MC Swp)	22MC 23MC 25.5MC	Any	Vert. amp. to point (A). Low side to chassis.	A6	Adjust A6 so that the 25.5MC marker is at approximately 50% of response. If necessary retouch A1 through A5 for proper response as per fig. 1.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (grid) of 6AH6 (V8). Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (B) Common to chassis.	A7, A8	Adjust for maximum deflection.
8.	"	"	"	"	DC probe to point (C) Common to chassis.	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
7.	.001MFD	High side to pin 1 (Grid) of 6AH6 (V8). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B). Low side to chassis.	A7, A8	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as per fig. 2.
8.	"	"	"	"	"	Vert. amp. to point (C). Low side to chassis.	A9	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.

OSCILLATOR ALIGNMENT

A10 is an all channel oscillator circuit adjustment and should be adjusted if the majority of channels appear to be off frequency approximately the same amount in the same direction. All through A21 are individual channel oscillator circuit adjustments and are accessible through numbered holes in the front of the tuner. All serves both channels 13 and 12 and is aligned for which ever channel is in use locally.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	213.MC (10MC Swp)	211.25MC	13	Vert. amp. to point (A). Low side to chassis.	A11	Adjust to place video marker at 50% on response curve as per fig. 4. If any channel adjustmenthas insufficient range make slight compromise adjustment of A10, then recheck all other channels.
			207MC (10MC Swp)	205.25MC	12		A11	
			201MC (10MC Swp)	199.25MC	11		A12	
			195MC (10MC Swp)	193.25MC	10		A13	
			189MC (10MC Swp)	187.25MC	9		A14	
			183MC (10MC Swp)	181.25MC	8		A15	
			177MC (10MC Swp)	175.25MC	7		A16	
			85MC (10MC Swp)	83.25MC	6		A17	
			79MC (10MC Swp)	77.25MC	5		A18	
			69MC (10MC Swp)	67.25MC	4		A19	
			63MC (10MC Swp)	61.25MC	3		A20	
			57MC (10MC Swp)	55.25MC	2		A21	

4.5MC TRAP ALIGNMENT

Turn the set on and tune in a TV station.
Examine the picture for evidence of 4.5MC beat pattern. If necessary adjust A22 for minimum 4.5MC interference.

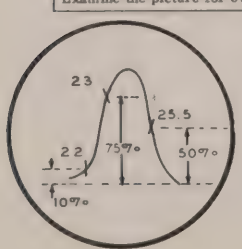


FIG. 1

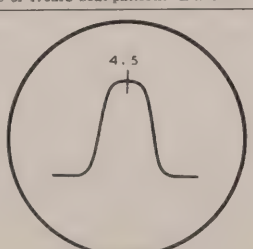


FIG. 2

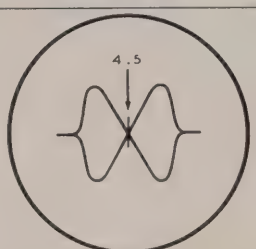


FIG. 3

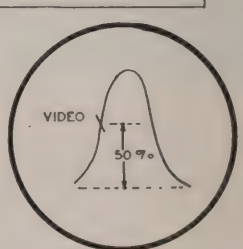
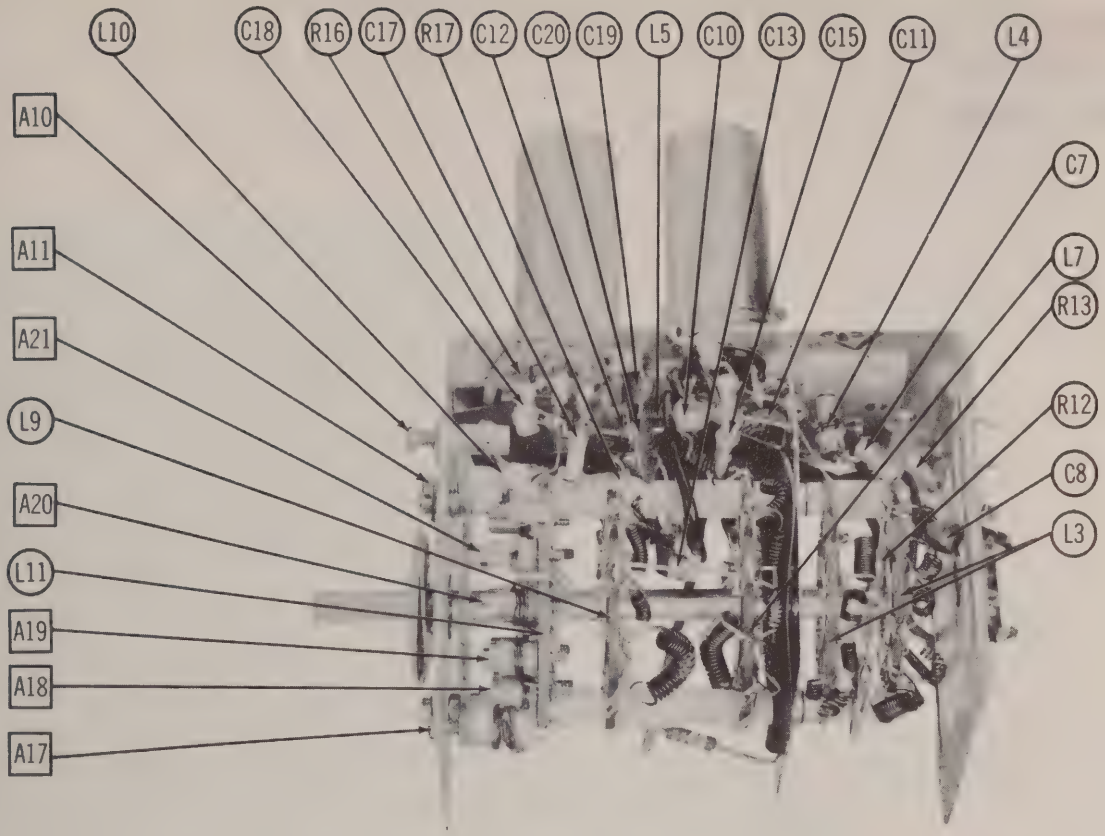
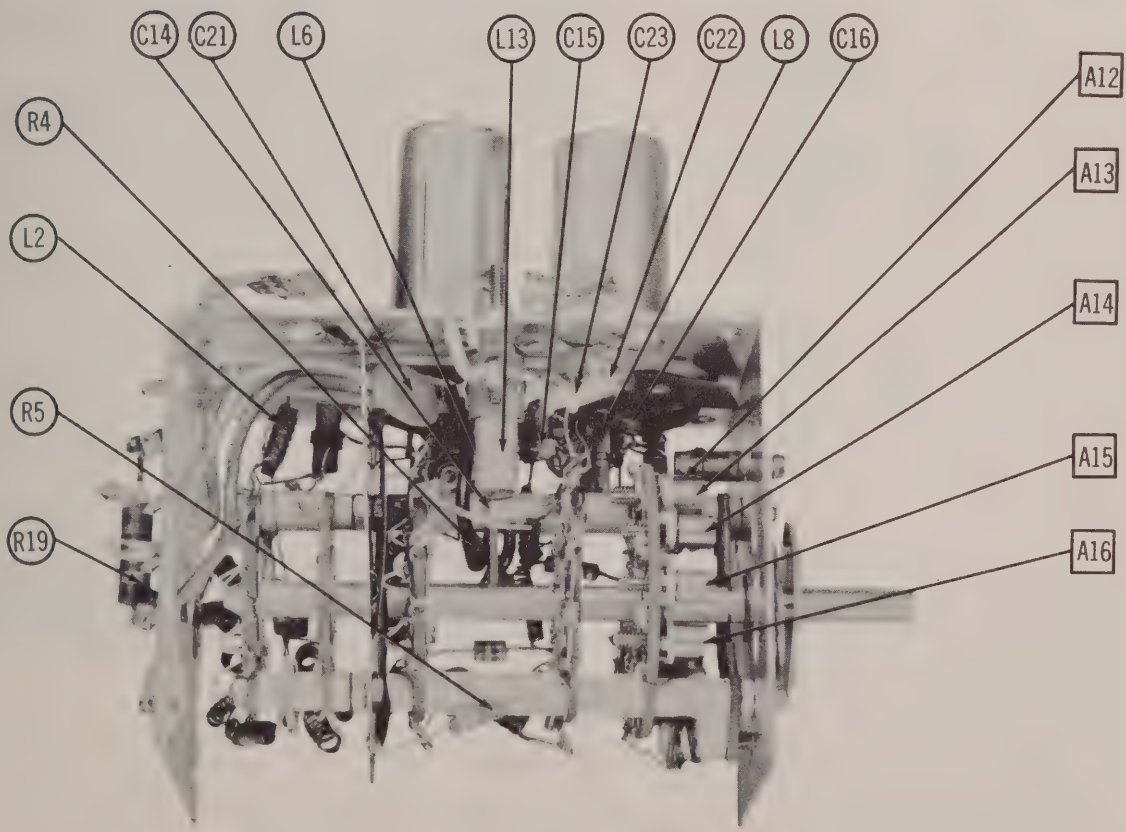


FIG. 4



RF TUNER-RIGHT SIDE

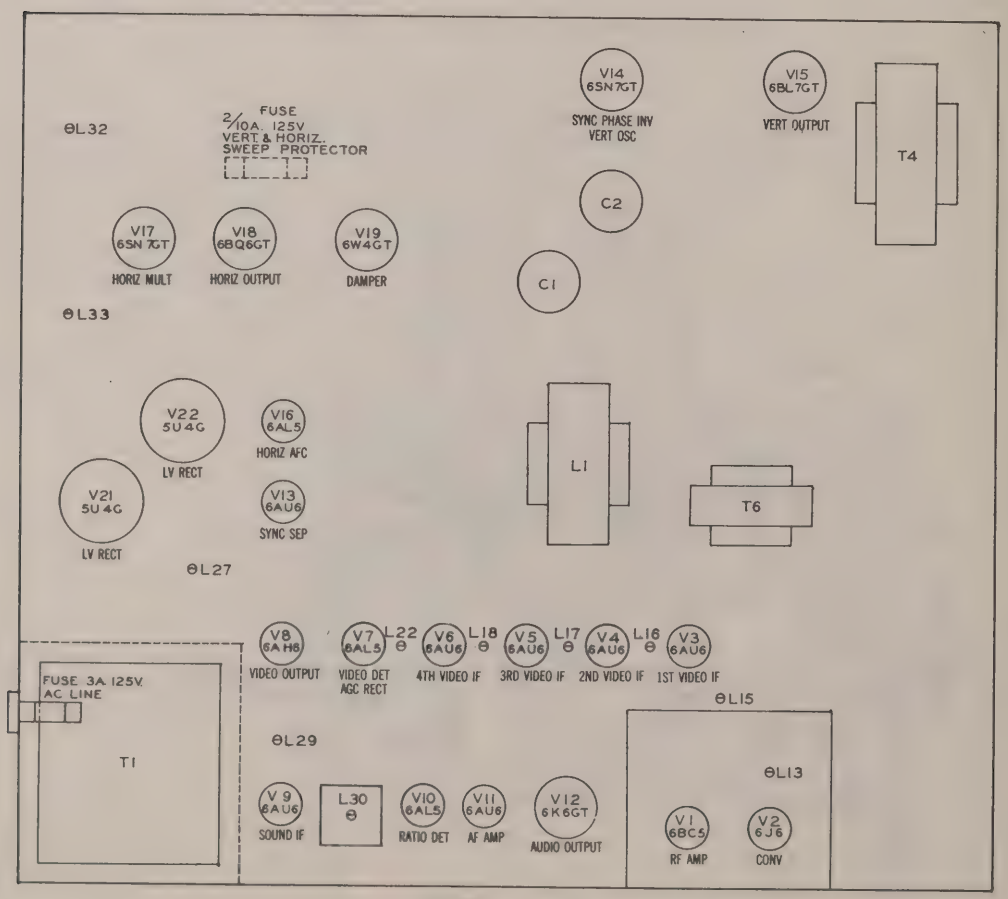


RF TUNER-LEFT SIDE

RESISTANCE MEASUREMENTS

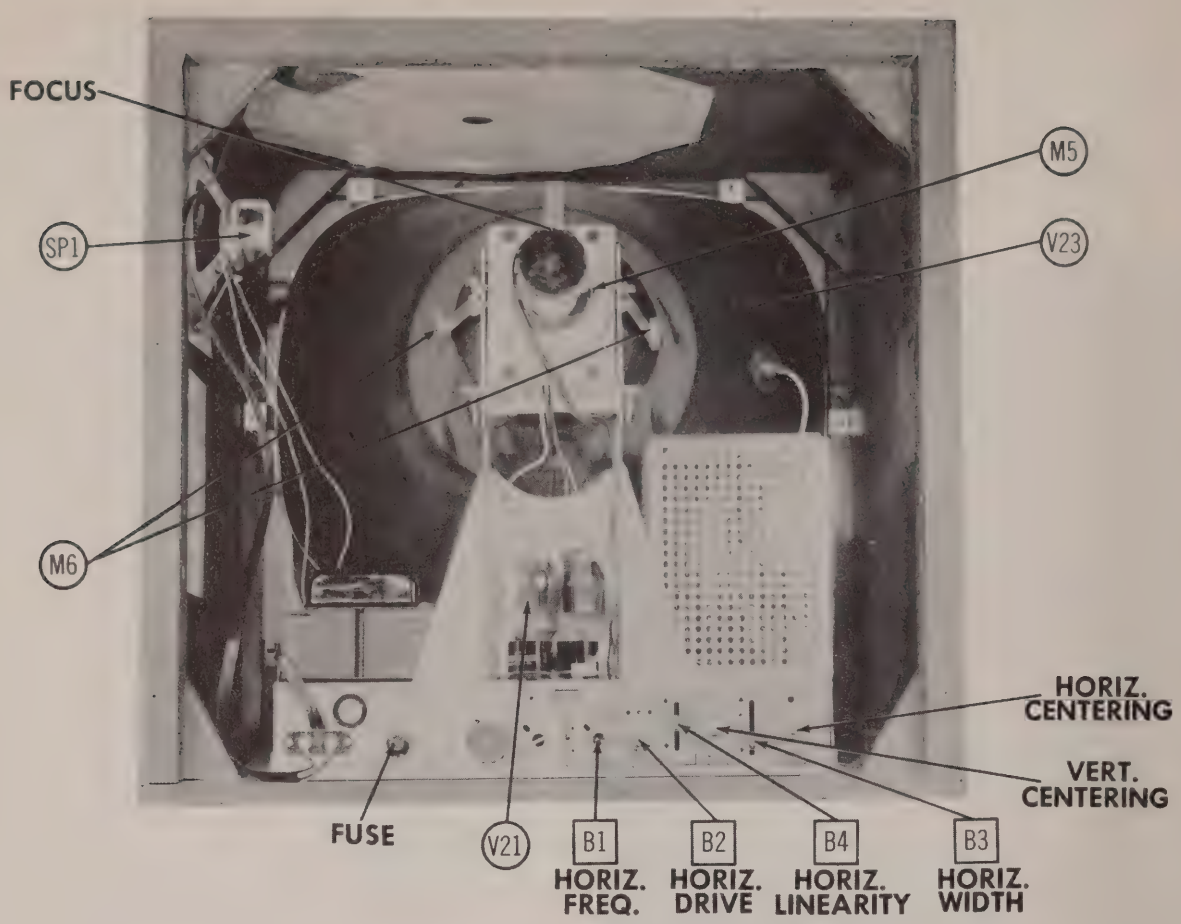
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BC5	700KΩ	0Ω	.1Ω	0Ω	†5.5KΩ	†5.5KΩ	0Ω		
V 2	6J6	†27KΩ	†3.3KΩ	0Ω	.1Ω	220KΩ	15KΩ	0Ω		
V 3	6AU6	695KΩ	0Ω	0Ω	.1Ω	†1.5KΩ	†3.3KΩ	82Ω		
V 4	6AU6	695KΩ	0Ω	0Ω	.1Ω	†510Ω	†3KΩ	82Ω		
V 5	6AU6	695KΩ	0Ω	0Ω	.1Ω	†510Ω	†3.3KΩ	100Ω		
V 6	6AU6	3.4Ω	0Ω	0Ω	.8Ω	†1.5KΩ	†3.6KΩ	150Ω		
V 7	6AL5	.1Ω	470KΩ	0Ω	1.5Ω	53KΩ	0Ω	6.8KΩ		
V 8	6AH6	470KΩ	0Ω	0Ω	.1Ω	†5.5KΩ	†50KΩ	390Ω		
V 9	6AU6	.8Ω	0Ω	0Ω	.1Ω	†33KΩ	†33KΩ	270Ω		
V 10	6AL5	INF	INF	0Ω	.1Ω	10KΩ	0Ω	9.5KΩ		
V 11	6AU6	10Meg	0Ω	0Ω	.1Ω	†570KΩ	†2.2Meg	6.8Ω		
V 12	6K6GT	INF	0Ω	†1KΩ	†565Ω	470KΩ	†100KΩ	.1Ω	470Ω	
V 13	6AU6	740KΩ	0Ω	.1Ω	0Ω	†2.3Meg	†3.3Meg	0Ω		
V 14	6SN7GT	†2.3Meg	†10KΩ	3.3KΩ	2Meg	#625KΩ	0Ω	0Ω	.1Ω	
V 15	6BL7GT	2.2Meg	†950Ω	400Ω	2.2Meg	†950Ω	400Ω	.1Ω	0Ω	
V 16	6AL5	100KΩ	100KΩ	0Ω	.1Ω	570KΩ	0Ω	570KΩ		
V 17	6SN7GT	940KΩ	†5.8KΩ	820Ω	110KΩ	#180KΩ	820Ω	0Ω	.1Ω	
V 18	6BQ6GT	INF	.1Ω	†7.7KΩ	†7.6KΩ	560KΩ	560KΩ	0Ω	0Ω	TOP CAP #42Ω
V 19	6W4GT	INF	INF	300KΩ	INF	†110Ω	INF	†.2Ω	†0Ω	
V 20	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP #442Ω
V 21	5U4G	INF	40KΩ	INF	18Ω	INF	18Ω	INF	40KΩ	
V 22	5U4G	†.2Ω	40KΩ	INF	17Ω	INF	17Ω	INF	40KΩ	
V 23	21EP4	0Ω	60KΩ	PIN 10 #47KΩ	PIN 11 250KΩ	PIN 12 .1Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PINS 2 OF V21 & V22
# MEASURED FROM PIN 3 OF V19



BOTTOM VIEW

TUBE PLACEMENT CHART



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-position of its range. Adjust the horizontal lock slug (B1) until the picture is synchronized horizontally.

The picture should now lock in evenly from either side of the mid-position of the horizontal hold control.

If necessary, slightly retouch B1 for this condition.

Connect the D.C. probe of a VTVM to point D (to be found on top rear of chassis) and connect the common lead to chassis.

Adjust the horizontal drive trimmer (B2) for a voltage of -28 volts.

Adjust the width slug (B3) for a picture slightly wider than enough to fill the picture mask horizontally.

To set the horizontal linearity control turn the set off, discharge the picture tube capacity to eliminatel the shock hazard, and remove the fuse in the high voltage compartment.

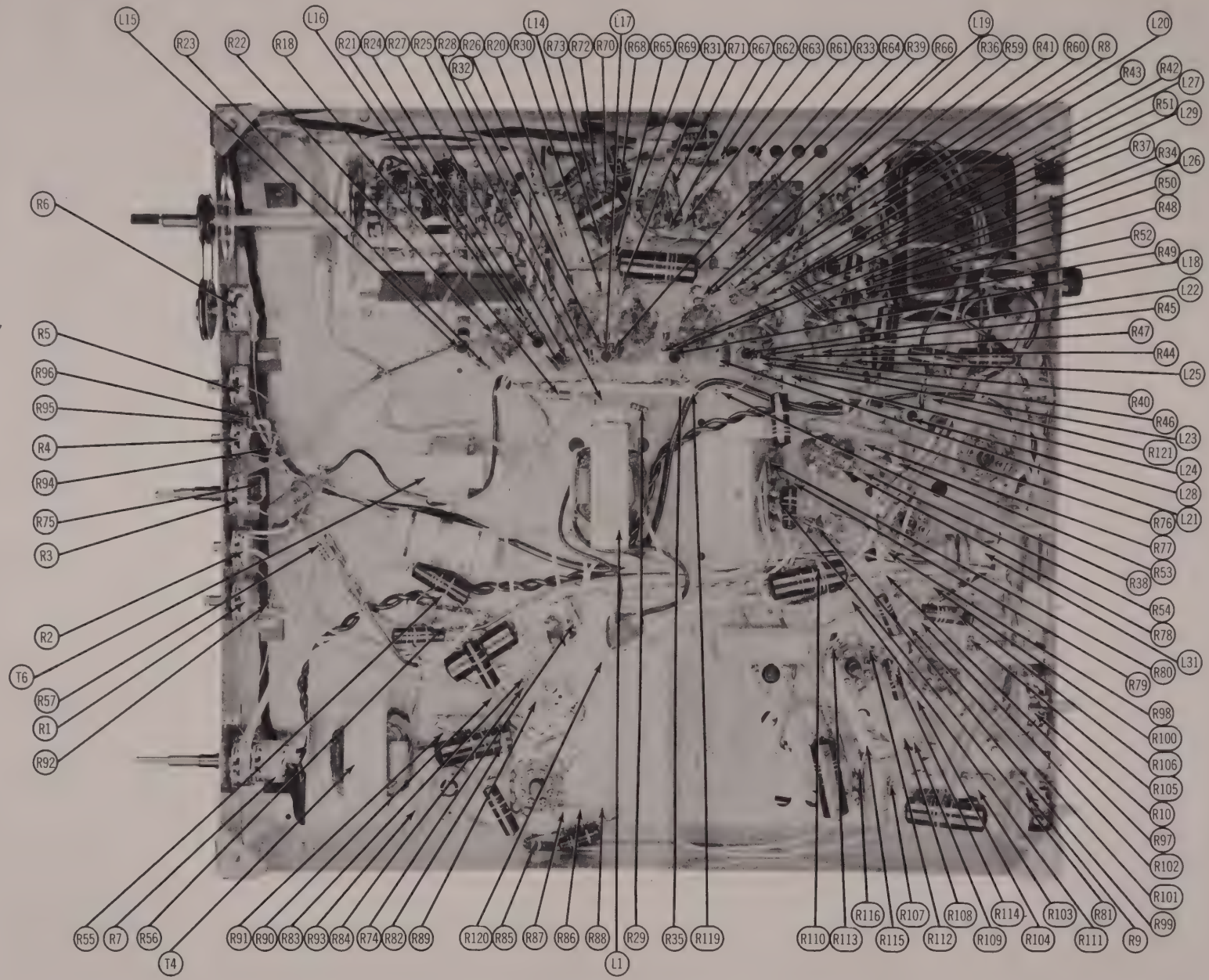
Connect a D.C. milliameter across the fuse holder terminals, using the 150ma. scale.

Turn the set on and adjust the horizontal linarity slug (B4) for MINIMUM current indication on the meter.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 11 wood screws & 1 metal screw. Remove rear cover.
3. Disconnect speaker leads & built in antenna.
4. Remove 4 speaker nuts. Remove speaker.
5. Remove 5 chassis bolts. Remove chassis.

Note: FOR PICTURE TUBE REMOVAL IT IS NECFSSARY TO R EMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier	6BC5	6BC5	7BD	
V2	Converter	6J8	6J8	7BF	
V3	Ist. Video IF Amp.	6AU6	6AU6	7BK	
V4	2nd. Video IF Amp.	6AU6	6AU6	7BK	
V5	3rd. Video IF Amp	6AU6	6AU6	7BK	
V6	4th. Video IF Amp.	6AU6	6AU6	7BK	
V7	Video Detector-AGC Rectifier	6AL5	6AL5	6BT	
V8	Video Output	6AH6	6AH6	7BK	
V9	Sound IF Amp.	6AU6	6AU6	7BK	
V10	Ratio Detector	6AL5	6AL5	6BT	
V11	AF Amplifier	6AU6	6AU6	7BK	
V12	Audio Output	6M6GT	6M6GT	7S	
V13	Sync Separator	6AU6	6AU6	7BK	
V14	Sync Phase Inv.-Vert. Oscillator	6SN7GT	6SN7GT	8BD	
V15	Vert. Output	6BL7GT	6BL7GT	8BD	
V16	Horiz. AFC	6AL5	6AL5	6BT	
V17	Horiz. Mult.	6SN7GT	6SN7GT	8BD	
V18	Horiz. Output	6BQ6G	6BQ6G	6AM	
V19	Damper	6W4GT	6W4GT	4CG	
V20	HV Rectifier	1B3GT	1B3GT	3C	
V21	LV Rectifier	5U4G	5U4G	5T	
V22	LV Rectifier	5U4G	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SENTINEL PART No.	REPLACEMENT DATA: SYLVANIA PART No.		RTMA BASE TYPE	NOTES
V23A	21EP4	21EP4		12D	① Circuit changes necessary
		21EP4A	①	12D	
		21FP4	①	12C	
		21FP4A	①	12C	
B	17RP4	17RP4		12L	
C	17HP4A			12C	
		17HP4		12C	
D	24BP4			12C	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	●60	350	25E59	AFH4-403		UPT429		FP430.9	TVL-4720	
B	●40	350								
C	●40	350								
C2A	●10	450	25E61	AFH3-51		UP1145		FP375.8	TVL-3776	
B	10	300								
C	●10	300								
C3A	●50	150	25E60	AFH3-82		UP4015V; BRH501			TVL-3417 TVA-1310	
B	▲100	50								
C	20	25								
C4	1000	3	25E50	PRS6/1000		BRH610		TC310	TVA-1104	
C5	10	250	25E35	PRS250/12		BR1225A		TC52	TVA-1504	
C6	10	25	25E8	PRS25/10		BR102A		TC22	TVA-1204	
C7	15		ST-226	SII5	D6-150		GP1K-150	UC-5415	5GA-Q15	
C8	500		ST-231	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C9	470		ST-233	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C10	500		ST-231	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C11	500		ST-231	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C12	18		ST-224							
C13	51		ST-229							
C14	1.5		ST-209	SII.5NP0	TCZ-1.5		NP0K-1R5	ZT-5515	5TCCB-V15	
C15	470		ST-232	SI470	D6-471		GP2K-471	UC-5347	5GA-T47	
C16	51		ST-229							
C17	10		ST-228	SII0N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C18	3		ST-207				N330K-030			
C19	500		ST-231	SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	
C20	5000		ST-211	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C21	5000		ST-211	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C22	15		ST-226	SII5	D6-150		GP1K-150	UC-5415	5GA-Q15	
C23	75		ST-227	SI75	D6-750	TM5Q75	GP1K-750	UC-5475	5GA-Q75	
C24	100		23E2027-2	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C25A	2500		23E2037-5	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C26	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C27	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C28	100		23E2027-2	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C29A	1500		23E2037-5	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C30	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C31	100		23E2027-2	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C32A	1500		23E2037-5	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C33	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C34	100		23E2027-2	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C35A	1500		23E2037-5	BPD-2X0015	DD-2-152	TM5DD15	812-0015	DCD-5215	5HK-2D15	
B	1500									
C36	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C37	220		23E2027-6	SI220	D6-221	5W5T25	GP2K-221	UC-5322	5GA-T22	
C38	25		23E36			PJ2P5	N750K-250	PT405	2TM-P47	
C39	.47	200	23E3220	P288-47						
C40	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C41	10		23E25	SII0N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C42	.1	200	23E3216	P288-1	DF-104	PJ2P1		PT401	2TM-P1	
C43	.022	400	23E3412	P488-022	DF-203	PTE4S22		PT4122	4TM-S22	
C44	.1	400	23E3416	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C45	100		23E3	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C46	.1	600		P588-1	DF-104	PTE6P1		PT601	6TM-P1	Note 1
C47	2		23E21							
C48	3		23E13				N750K-030			

PARTS LIST AND DESCRIPTIONS

CAPACITORS (CONT.)

ITEM No.	RATING: CAP	RATING: VOLT	REPLACEMENT DATA: SENTINEL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C49A	4000		23E2037	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C50	500	500	23E45-10	1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C51	500	500	23E45-10	1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C52	500	500	23E45-10	1468-0005	D6-501	5W5T5	GP2K-501	MC245	1FM-35	
C53	.0022	400	23E3206	P688-0022	D6-222	PTE6D22	GP2-333-222	PT6222	6TM-D22	
C54	.047	200	23E3214	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C55	.0047	400	23E3208	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C56	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C57	.01	600	23E3610	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C58	.01	600	23E3610	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C59	.047	600	23E3614	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C60	.0047	600	23E3608	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C61	.047	400	23E3614	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C62	250		23E2030-3	SI250	D6-251	TM5T25	GP2K-251	UC-5325	5GA-T25	
C63	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C64	.047	400	23E3414	P488-047	DF-503	PTE4S47		PT415	4TM-S47	
C65	.01	600	23E3410	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C66A	.002			P688-002		PTE6D2	GP2-333-202	PT622		
B	.005		●23E2023-4	P688-005	●PC-100	PTE6D5	GP2-333-502	PT625	●101C1	
C	.005			P688-005		PTE6D5	GP2-333-502	PT625		
C67	.0033	400	23E3407	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233		
C68	.1	600	23E3616	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C69	.01	600	23E3410	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C70	.1	600	23E3616	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C71	.01	600	23E3610	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C72	.01	600	23E3610	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C73	.047	600	23E3614	P688-047	DF-503	PTE6S47		PT6147	6TM-S47	
C74	.1	400	23E3416	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C75	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C76	1000		23E2025-3	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C77	.0033	400	23E3407	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D33	
C78	100		23E2027-2	SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C79	.047	1000	23E31014	P1088-047				PT1615	MB-S5	
C80	.0047	400	23E3206	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C81	.047	200	23E3214	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C82	.22	200	23E3218	P488-22		PTE4P22		PT4025	2TM-P22	
C83	4000	500	23E86	1464-004		IDR5D4		MCB463		
C84	600		23E2030-13						MS-36	
C85	500		23E2030-9	1469-0005		5R5T5		MCB245	MS-35	
C86	250		23E2030-3	1469-00025		5R5T25		MCB240		
C87	.001	600	23E3604	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C88	.2	400	23E3418	P488-22		PTE4P22		TP429	2TM-P22	
C89	.047	600	23E3614	P688-047		PTE6S47		PT6147	6TM-S47	
C90	.047	600	23E3614	P688-047		PTE6S47		PT6147	6TM-S47	
C91	.47	200	23E3220	P288-47		PJ2P5		PT405	2TM-P47	
C92	500	20000	23E2039	HV20C	TV3-502	MM-C20T5	413-501		20DC-T5	
C93	.01	600	23E3610	6892GZKY-01		PJ6S1		PT611	6TM-S1	
C94	.01	600	23E3610	6892GZKY-01		PJ6S1		PT611	6TM-S1	

Note 1. Used with Electrostatic focus only. Some models use .047MFD (Part #23E3616)
● Items C66A, C66B, C68C, R86A, R86B, R86C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2Meg	½	28E72	Q11-139	AG-83-S	AB-75	SU-56	Vert. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A
R2A	250KΩ	½	28E79	Q11-130	AG-55-S	AB-50	SU-46	Vert. Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R2A
R3A	150KΩ	½	28E75		AG-51-Z		U-42	Tone
B	Shaft		Not Req.		KSS-3		Not Req.	Attach to R3A
R4A	2000Ω	½	28E80	Q11-110	AG-11-S	AB-6	R2500L	Vert. Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	DS-36	Attach to R4A
R5A	50KΩ	½	28E43	Q11-123	AG-44-S	AB-31	SU-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R5A
R6A	1000Ω	½	28E65	Q11-108	AM-8-S	AB-5	R1000L	Contrast
B	Shaft		Not Req.	Not Req.	RS-2	AK-8	DS-36	Attach to R6A
R7A	35KΩ	½	28E64-3	QJ-329 *	RTV-248	SBB-658-S	UF54L	Brightness - Panel
B	500KΩ	½					UR55A	Volume - Rear
C	Switch		Not Req.				US-26	Attach to R7B
R8	1000Ω	1	28E81					Video Output Plate Load -Wire Wound
R9A	60Ω	2	28E54	W-60	A43-75	VK-117	R50L	Horiz. Centering - Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R9A
R10	80Ω	2	28E78	W-75	RTV-339	VK-121	C100P	Vert. Centering - Wire Wound
R11A	2Meg	½	28E72	Q11-139	AG-83-S	AB-75	SU-56	Focus - See Note
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R11A

Note . Use only with Electrostatic Focus Picture Tubes.
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-122 & P1-114 (Panel)
B13-133 & R1-207 (Rear) & SWITCH 76-1.

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	IRC PART No.	NOTES
R12	4700Ω	½	27E472-2	BTS-4700	
R13	15KΩ 20%	½	27E153-2	BTS-15K	
R14	22000Ω 20%	½	27E472-2	BTS-2200	
R15	220KΩ	½	27E224-2	BTS-220K	
R16	15KΩ 20%	½	27E153-2	BTS-15K	
R17	4700Ω	½	27E472-2	BTS-4700	
R18	680Ω	1	27E681-3	BTA-680	
R19	22KΩ	1	27E223-3	BTA-22K	
R20	330Ω		27E331-2	BTS-330	
R21	330Ω		27E331-2	BTS-330	
R22	3900Ω 5%		27E3909-43	BTS-3900 5%	
R23	82Ω		27E820-2	BTS-82	
R24	330Ω		27E331-2	BTS-330	
R25	1000Ω		27E102-2	BTS-1000	
R26	4700Ω 5%		27E1005-26	BTS-4700 5%	
R27	82Ω		27E820-2	BTS-82	
R28	330Ω		27E331-2	BTS-330	
R29	330Ω		27E331-2	BTS-330	
R30	330Ω		27E331-2	BTS-330	
R31	5600Ω 5%		27E1009-8	BTS-5600 5%	
R32	100Ω		27E101-2	BTS-100	
R33	330Ω		27E331-2	BTS-330	
R34	330Ω		27E331-2	BTS-330	
R35	330Ω		27E331-2	BTS-330	
R36	6800Ω 5%			BTS-6800 5%	
R37	150Ω		27E151-2	BTS-150	
R38	1000Ω		27E102-2	BTS-1000	
R39	330Ω		27E331-2	BTS-330	
R40	3.3Meg		27E335-2	BTS-3.3Meg	
R41	220KΩ		27E224-2	BTS-220K	
R42	470KΩ 20%		27E474-2	BTS-470K	
R43	3.2Ω		27E103-2		
R44	47KΩ		27E473-3	BTS-47K	
R45	10KΩ		27E103-2	BTS-10K	
R46	6800Ω 5%		27E1009-13	BTS-6800 5%	
R47	470KΩ 20%	½	27E474-2	BTS-470K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: SENTINEL PART No.	IRC PART No.	NOTES
R48	100KΩ	½	27E104-2	BTS-100K	Note 1
R49	100KΩ	½	27E104-2	BTS-100K	Note 3
R50	2700Ω	½	27E272-2	BTS-2700	
R51	4700Ω	2	27E1009-45	BTB-4700	
R52	27KΩ	½	27E273-2	BTS-27K	
R53	470KΩ	½	27E474-2	BTS-470K	Note 3
R54	470KΩ	½	27E474-2	BTS-470K	Note 3
R55	22KΩ	½	27E223-2	BTS-22K	
R56	27KΩ	½	27E273-2	BTS-27K	
R57	18KΩ	½	27E183-2	BTS-18K	
R58	47KΩ	½	27E473-2	BTS-47K	Note 2
R59	270Ω	½	27E271-2	BTS-270	
R60	33KΩ	½	27E333-3	BTA-33K	
R61	270Ω	½	27E271-2	BTS-270	
R62	39KΩ	½	27E393-2	BTS-39K	
R63	3300Ω 5%	½	27E1009-29	BTS-3300 5%	
R64	2700Ω 5%	½	27E1009-28	BTS-2700 5%	
R65	6800Ω 5%	½	27E1009-13	BTS-6800 5%	
R66	6800Ω 5%	½	27E1009-13	BTS-6800 5%	
R67	10Meg 20%	½	27E106-2	BTS-10Meg	
R68	2.2Meg	½	27E225-2	BTS-2.2Meg	
R69	470KΩ	½	27E474-2	BTS-470K	
R70	100KΩ 20%	½	27E104-2	BTS-100K	
R71	6.8Ω	½	27E105-9	BW-½-6.8	
R72	150Ω	½	27E151-2	BTS-150	
R73	470KΩ 20%	½	27E474-2	BTS-470K	
R74	470Ω	½	27E471-3	BTA-470	
R75	2200Ω	½	27E222-2	BTS-2200	
R76	270KΩ 20%	½	27E274-2	BTS-270K	
R77	470KΩ 20%	½	27E474-2	BTS-47UK	
R78	3.3Meg 20%	½	27E335-2	BTS-3.3Meg	
R79	68KΩ	½	27E683-2	BTS-68K	
R80	2.2Meg 20%	½	27E225-2	BTS-2.2Meg	
R81	3300Ω 5%	½	27E1009-29	BTS-3300 5%	
R82	3900Ω	½	27E392-2	BTS-3900	
R83	3900Ω 5%	½	27E1009-43	BTS-3900 5%	
R84	47KΩ	½	27E473-2	BTS-47K	
R85	15KΩ	½	27E153-2	BTA-15K	
R86A	22KΩ	½	●23E2023-4	BTS-22K BTS-8200 BTS-8200	
B	8200Ω	1			
C	8200Ω	1			
R87	15KΩ	1	27E153-3	BTS-15K	
R88	1.2Meg	½	27E1009-5	BTS-1.2Meg	
R89	470KΩ 20%	½	27E474-2	BTS-470K	
R90	6800Ω	½	27E682-2	BTS-6800	
R91	4.7Meg 20%	½	27E475-2	BTS-4.7Meg	
R92	220KΩ 20%	½	27E224-2	BTS-220K	
R93	2.2Meg 20%	½	27E225-2	BTS-2.2Meg	
R94	470Ω	½	27E471-2	BTS-470	
R95	5600Ω	½	27E562-3	BTS-5600	Note 4
R96	5600Ω	½	27E562-3	BTS-5600	Note 3
R97	100KΩ 5%	½	27E1009-27	BTS-100K 5%	
R98	100KΩ 5%	½	27E1009-27	BTS-100K 5%	
R99	100KΩ	½	27E104-3	BTS-100K	
R100	470KΩ 20%	½	27E474-2	BTS-470K	
R101	470KΩ 20%	½	27E474-2	BTS-470K	
R102	27KΩ	½	27E273-2	BTS-27K	
R103	6800Ω	½	27E682-2	BTS-6800	
R104	820Ω 5%	½	27E1009-41	BTS-820 5%	
R105	82KΩ	½	27E823-2	BTS-82K	
R106	5600Ω 5%	½	27E1009-9	BTS-5600 5%	
R107	8200Ω 5%	½	27E1009-15	BTS-8200 5%	
R108	330KΩ 5%	½	27E1009-9	BTS-330K 5%	
R109	390KΩ 5%	½	27E1009-40	BTS-390K 5%	
R110	18KΩ	½	27E183-2	BTS-18K	
R111	18KΩ	½	27E183-2	BTS-18K	
R112	100Ω	½	27E101-2		
R113	100Ω	½	27E101-2		
R114	560KΩ	½	27E1009-11	BTS-560K	
R115	7500Ω	5	27E1016-17	1 3/4A-7500	
R116	47KΩ	½	27E473-2	BTS-47K	
R117	3.2Ω	½	27E1005-2		
R118	1.2Meg	½	27E1009-5		
R119	2500Ω	7	27E1016-19	1 3/4A-2500	
R120	470Ω	½	27E471-2	BTS-470	
R121	330KΩ 20%	½	27E334-2	BTS-330K	

All resistors ± 10% unless otherwise noted.
Note 1. Some models use a 47KΩ resistor in this application.
Note 2. Not used in all models.
Note 3. Some models use a 560KΩ resistor in this application.
Note 4. Some models use a 2200Ω resistor in this application.
● Items R86A, R86B, R86C, C66A, C66B, C68C are combined in one unit.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SENTINEL PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	6"	PM	2.6Ω	1E49 1E49-2 ① 1E34 1E34-2 1E34-3 ② 1E34-4 1E43 1E43-2 1E43-3 ③ 1E51 ④	ST-108 Mod. P6-X	6A1	① Alternate 6" PM Speaker ② 8" PM Speaker ③ 10" PM Speaker ④ 12" PM Speaker

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ 1.88A	525VCT @ 290ADC	5VAC @ 6A	6.3VAC @ 1.2A; SEC. 4: 6.3VAC @ 9A	22E59				

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	170Ω	980Ω	22E55-2	A-8125	A-3000	TB0-1 ②	A-97X	Vert osc. trans.
T3	425Ω Tap @ 25Ω	130 Tap @ 1.6Ω, 9.7Ω; SEC. 2: 0Ω	22E67	A-8130 ④	HVC-7⑤⑥		D-14	Horiz. output trans.
T4	750Ω Tap @ 9Ω		22E63	A-8123①	A-3037 ①	TS0-8①	A-102X	Vert output trans.
T5A	13Ω		2E-115	DY-8	MDF-70	TY-2	Y-12	Horiz. deflection coils.
B	5Ω		30E164-5 ③ 30E164-7 ③ 30E176 ③					Vert deflection coils

① Drill one new mtg. hole.
② Drill new mtg. holes.
③ Alternate deflection yoke.
④ Replace width coil with WC-5.
⑤ Replace width coil with MWC-1.
⑥ Connect AFC secondary for AFC voltage.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T6	6KΩ	2.6Ω	450Ω	.6Ω	22E35-3	A-3878	A-2930	R0-13	S-7X	① Drill one new mtg. hole.

PARTS LIST CONTINUED ON PAGE 15

PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	SENTINEL PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.230A	95Ω	2.8 Hy.	22E64	C-2325	C-2991 ①	TR-3300 ①	C-17X

① Drill one new mtg. hole.

COILS (RF-IF)

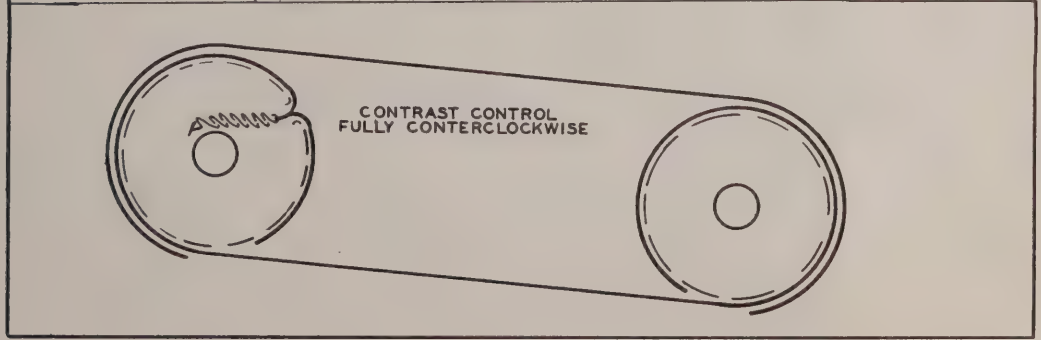
ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	SENTINEL PART No.	MERIT PART No.	IRC PART No.	
L2	Ant. Trans.	.2Ω	.1Ω	ST-240			
L3	Ant. Coils	0Ω					
L4	Ant. Coil	0Ω		ST-239			
L5	Fil. Choke	0Ω		ST-234			
L6	RF Coil	0Ω		ST-235			Channel 13
L7	RF Coils	0Ω					
L8	Mixer Grid	0Ω		ST-236			Channel 13
L9	Mixer Grid Coils	0Ω					
L10	Osc. Coil	0Ω		ST-237			Channel 13
L11	Osc. Coils	0Ω					
L12	RF Choke	1.2Ω		ST-233			
L13	Conv. Plate	.3Ω		ST-238			
L14	Fil. Choke	0Ω		2E78			
L15	1st. Video IF	.2Ω		20E720			
L16	2nd. Video IF	.1Ω		20E360	TV-103		
L17	3rd. Video IF	.1Ω		20E360	TV-102		
L18	4th. Video IF	.1Ω		20E360	TV-103		
L19	Grid Choke	3.4Ω		20E363-8			Wound on 10Meg resistor
L20	Fil. Choke	1.2Ω		2E92		CLA	1.5 Microhenries
L21	Plate Choke	3.4Ω		20E363-8			Wound on 10Meg resistor
L22	5th. Video IF	.1Ω		20E725	TV-102		
L23	Peaking Coil	7.5Ω		20E363-16			120 Microhenries wound on 10Meg resistor
L24	Peaking Coil	17Ω		20E363-10	TV-188		500 Microhenries wound on 10Meg resistor
L25	Cath. Choke	1.2Ω		2E92		CLA	1.5 Microhenires
L26	Peaking Coil	11Ω		20E363-14	TV-185		250 Microhenries wound on 10 Meg resistor
L27	4.5MC Trap	.3Ω		20E721	TV-151		
L28	Peaking Coil	17Ω		20E363-10	TV-188		500 Microhenries wound on 10Meg resistor
L29	Sound IF	2.6Ω		20E361			Tap @ .8Ω
L30	Ratio Det.	3.5Ω	.3Ω CT	20E684	*TV-110		Tertiary Winding .4Ω
L31	Horiz. Osc.	57Ω		20E409	TV-163		
L32	Width Coil	7Ω		20E685			
L33	Horiz. Lin.	17Ω		20E688	MWC-1		

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SENTINEL PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1		3A 125V.	40E8-10		313003 (3AG-S/B)	342001	MDX 3 2/10	HKP
M2		.2A 250V.	40E8-8		313.200 (3AG-S/B)	357001	MDL 2/10	4405

MISCELLANEOUS

ITEM No.	PART NAME	SENTINEL PART No.	NOTES
M3	RF Tuner	20E711	Complete with tubes
M4	Focus Magnet	62E2	Models 1U-449-A & 1U-450-A
M5	Ion Trap		
M6A	Magnet Assembly	20E726	Anti-Pin cushion correction.
B	Magnet Assembly	20E726-2	Model 1U-451-A (Anti-Pin cushion correction)
B2	Trimmer	24E16	Horiz. Drive (300-460MMF)
	Cabinet back	20E694	Includes line cord (Model 1U-447-A)
	Cabinet back	20E674-7	Includes line cord (Model 1U-448-A)
	Cabinet back	20E694-6	Includes line cord (Model 1U-449 & 450-A)
	Cabinet back	20E759	Includes line cord (Model 1U-451-A)
	Safety Glass	9E45-3	Model 1U-447-A
	Safety Glass	PE45-2	Model 1U-448-A
	Safety Glass	9E45	Model 1U-449 & 450-A
	Safety Glass	9E45-4	Model 1U-450-A
	Mask	36E84-2	Model 1U-447-A
	Mask	36E84	Model 1U-448-A
	Mask	36E83	Model 1U-449 & 450-A
	Mask	36E85	Model 1U-451-A



DRIVE CORD STRINGING

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MODEL 5292

SPARTON MODELS 5288, 5289, 5291, 5292, 5293, 5294, 5295, 5296A, 5297A, 5298

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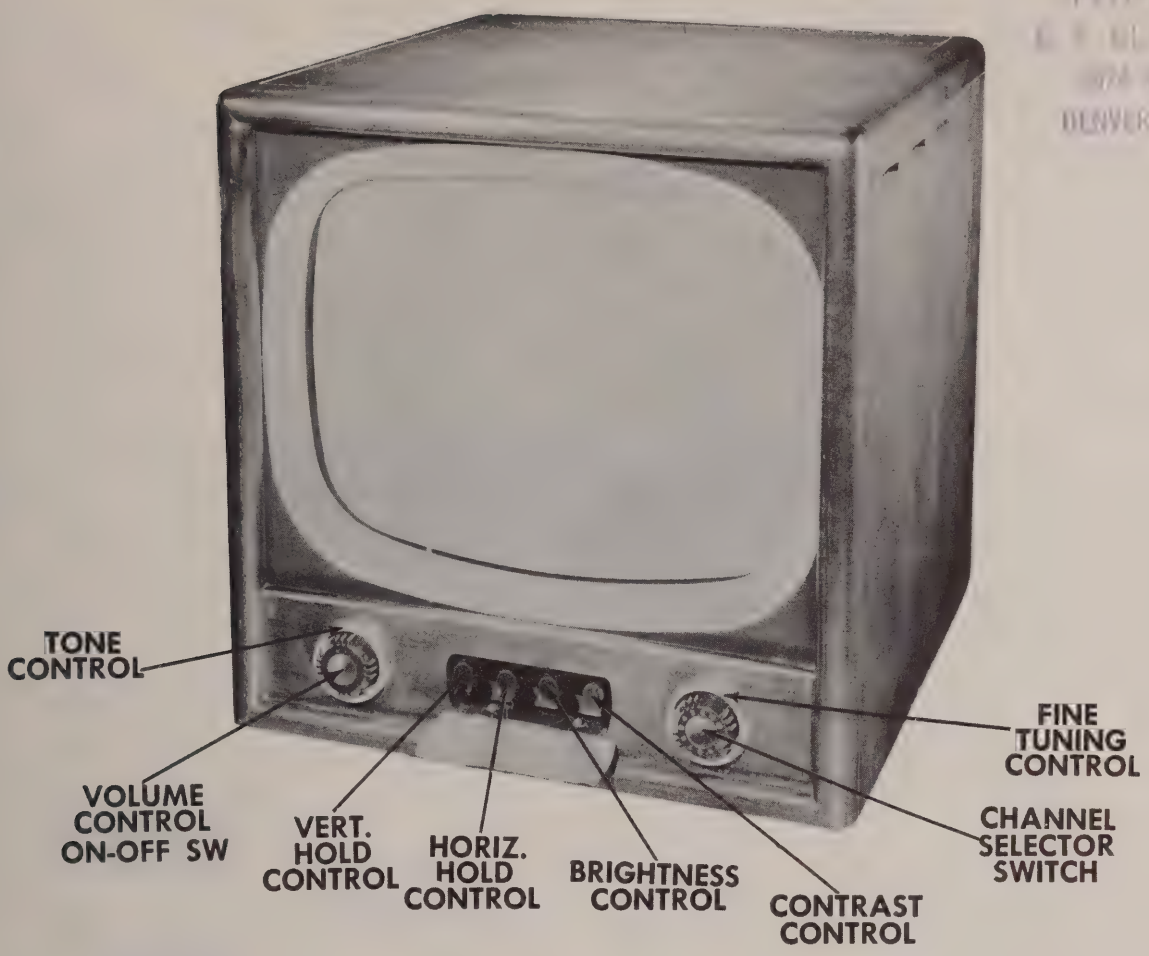
SPARTON MODELS 5288, 5289, 5291, 5292, 5293, 5294, 5295, 5296A, 5297A, 5298



SPARTON 5292

TRADE NAME	Sparton Models 5288, 5289, 5291, 5292, 5293, 5294, 5295, 5296A, 5297A, 5298 (Ch. 25CD202)
MANUFACTURER	Sparks-Withington Co., Jackson, Mich.
TYPE SET	Television Receiver
TUBES	Twenty-five
POWER SUPPLY	110-120 Volts AC-60 Cycle
RATING	2.06 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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FOR SERVICE INFORMATION ON RADIO CHASSIS USED IN MODELS 5296A AND 5297A, REFER TO PHOTOFACT SET 126 FOLDER 12.

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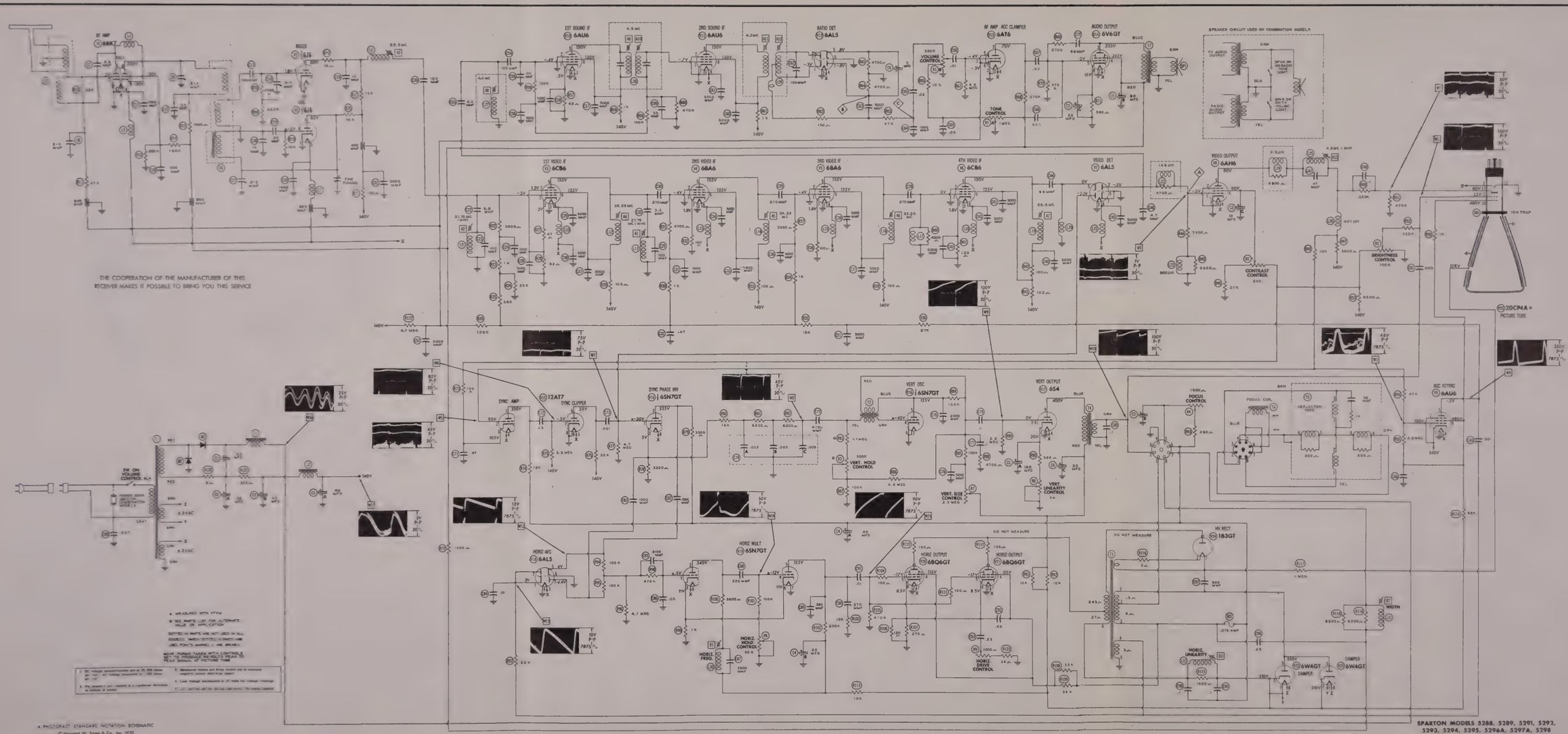

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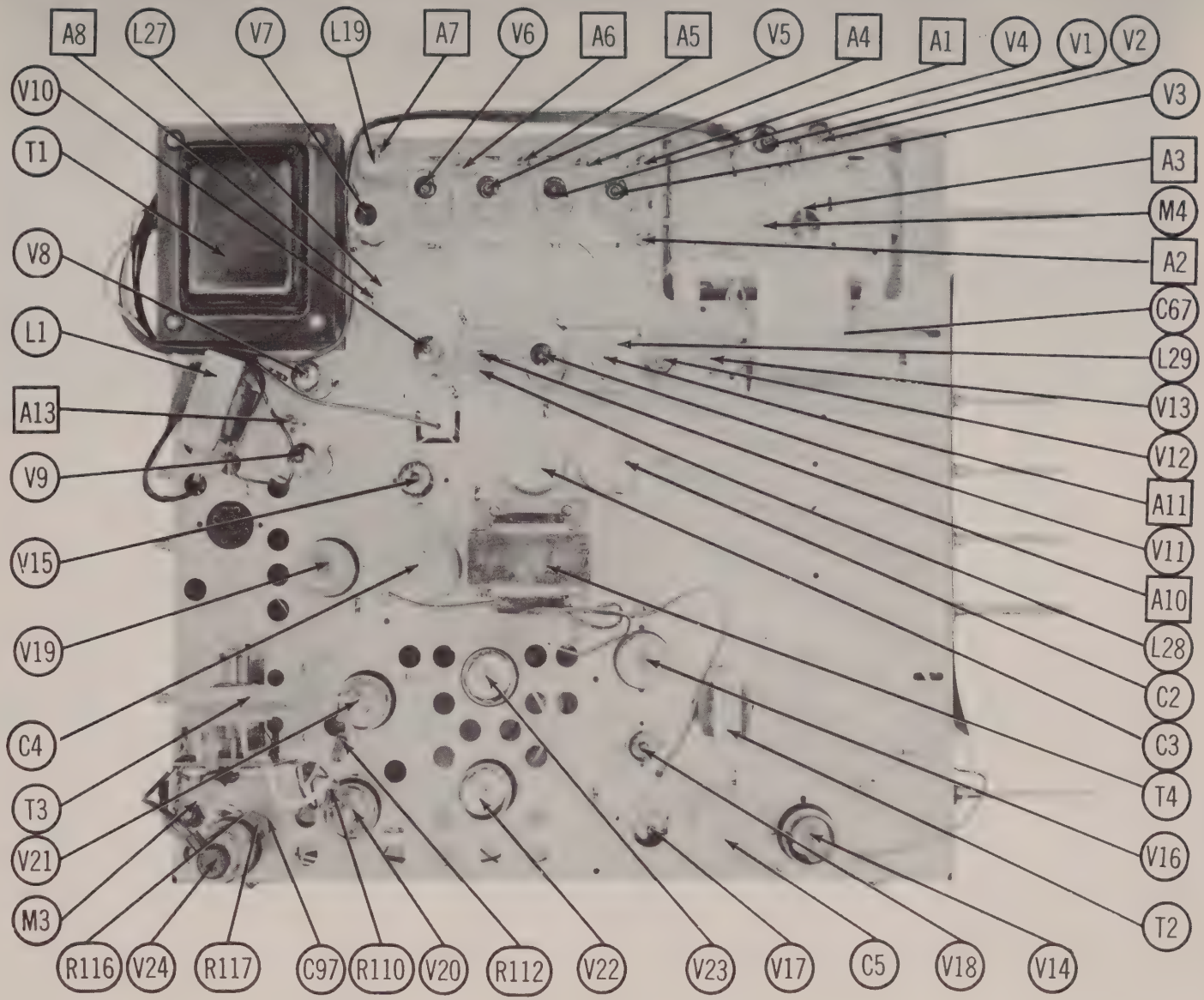
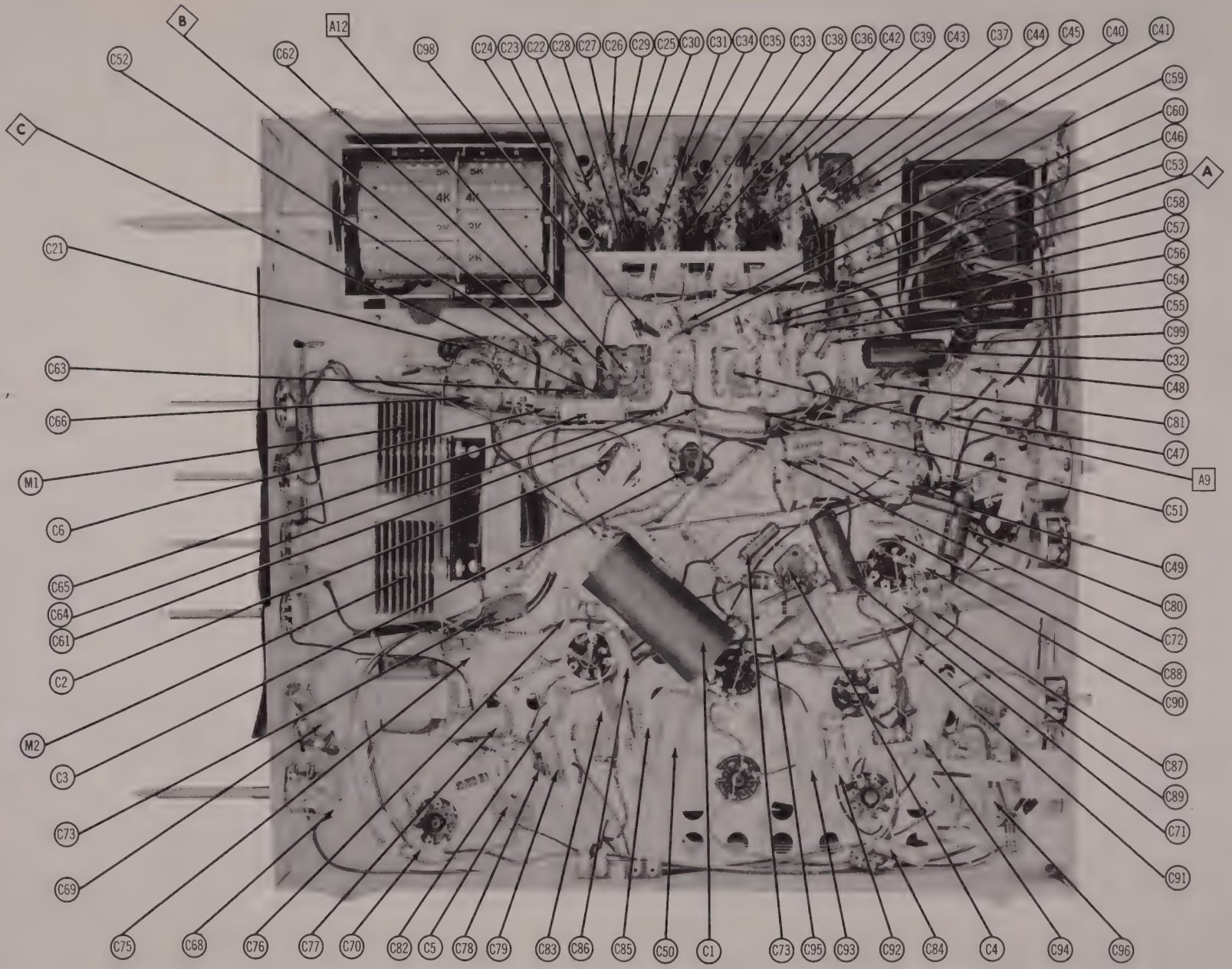
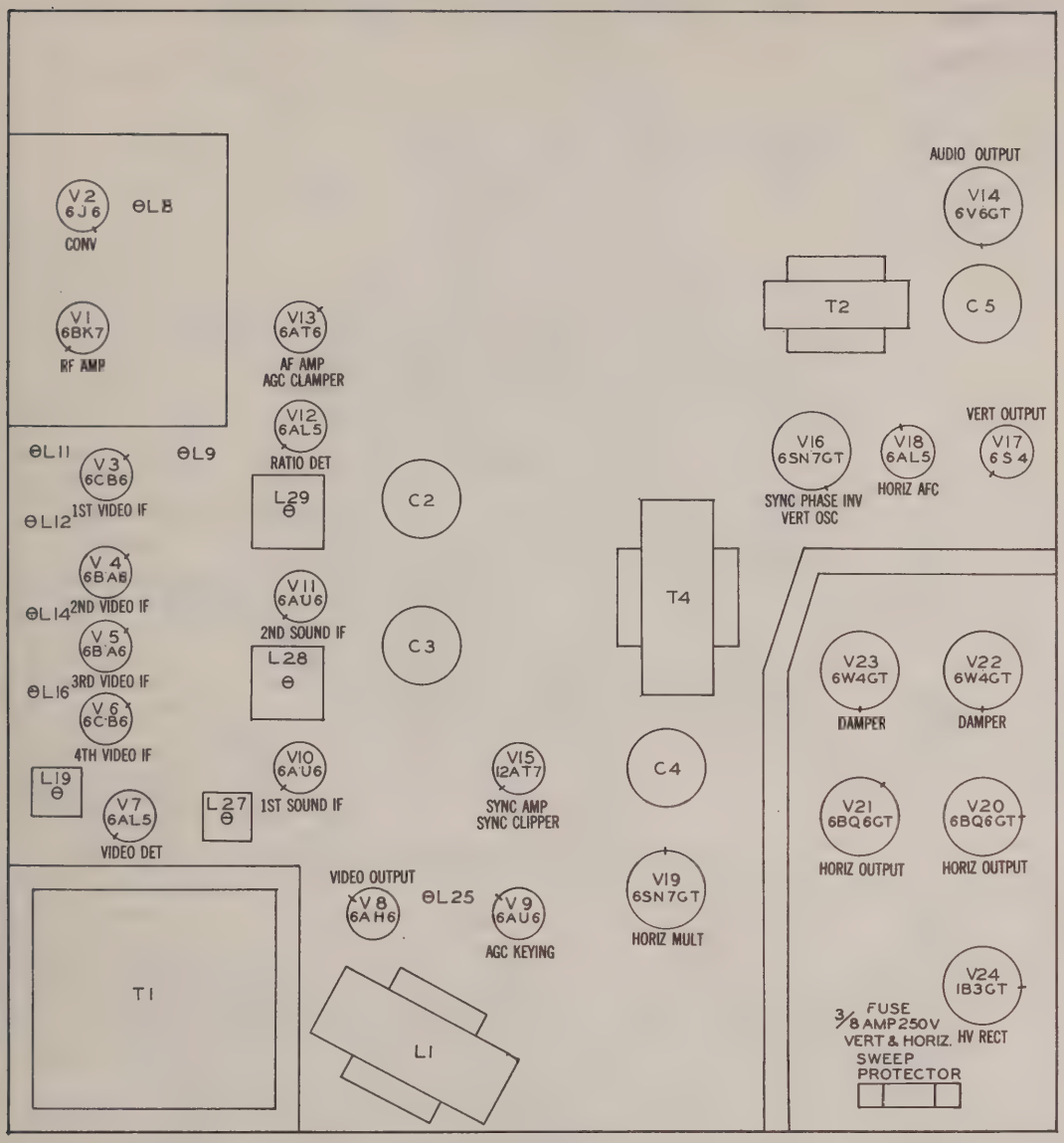


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms
Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - Selenium Rectifier (M1), (M2)

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3, V4, V5, V6, V7
No Pic, No Sound, Has Snow - V1, V2, V3
No Pic, Has Sound, Has Raster - V8, V25
Has Pic, No Sound - V10, V11, V12, V13, V14
Overloaded Picture - V7, V9

SYNC FAILURE
No Vert. Sync - V16
No Horiz. Sync - V16, V18, V19
No Vert. or Horiz. Sync - V15, V16

SWEEP FAILURE
No Raster, Has Sound - V19, V20, V21, V22, V23, V24, V25
No Vert. Deflection - V17
Poor Vert. Linearity or Foldover - V16, V7
Poor Horiz. Linearity or Foldover - V19, V20, V21, V22, V23
Narrow Picture - V19, V20, V21, V22, V23, M1, M2
Vert. Off Freq. - V16
Horiz. Off Freq. - V16, V18, V19

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removal of the horizontal multivibrator tube, V19.

VIDEO IF ALIGNMENT

Remove the converter tube, V2 and replace with A6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 4.5 volt battery to the ungrounded side of C32. Connect the positive lead to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	Direct	High side to an ungrounded utube shield floating over dummy converter tube (V2). Low side to chassis.	27.75MC . (Unmod)	Any	DC probe to point (A) Common to chassis.	A1	Adjust for MINIMUM deflection.
2.	"	"	21.75MC	"	"	A2	"
3.	"	"	22.5MC	"	"	A3	Adjust for maximum deflection.
4.	"	"	52.25MC	"	"	A4	"
5.	"	"	24.25MC	"	"	A5	"
6.	"	"	23.25MC	"	"	A6	"
7.	"	"	26.0MC	"	"	A7	"

OVERALL VIDEO IF RESPONSE CHECK

Leave the bias battery connected as under Video IF alignment.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2) . Low side to chassis.	24MC (10MC Swp)	22.7MC 25.5MC 26.25MC	Any	Vert. amp. thru 47KΩ to point (A) . Low side to chassis		Check for response curve as per fig. 1 If necessary retouch A3 through A7 for desired response.

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001Mfd.	High side to point A Low side to chassis.	4.5MC (Unmod.)	Any	DC probe to point (A) Common to chassis.	A8, A9, A10, A11	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (C) Common to chassis.	A12	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	.001MFD	High side to point A . Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point (B) . Low side to chassis.	A8, A9, A10, A11	Disconnect stabilizer capacitor C6. Adjust for curve of maximum amplitude and symmetry as per fig. 2.
10.	"	"	"	"	"	Vert. amp. to point C . Low side to chassis.	A12	Reconnect capacitor C6. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 3. SLIGHTLY retouch All for maximum amplitude and straightness of c ossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
10.	.001MFD	High side to point (A) . Low side to chassis.	4.5MC (Unmod.)	Any	DC probe thru crystal diode detector (fig.4) to pin 11 of picture tube Common to chassis.	A13	Adjust for MINIMUM deflection.

The tuner portion of this receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

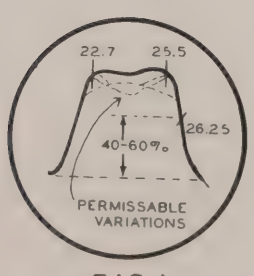


FIG. 1

FIG. 2

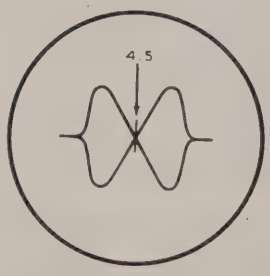


FIG. 3

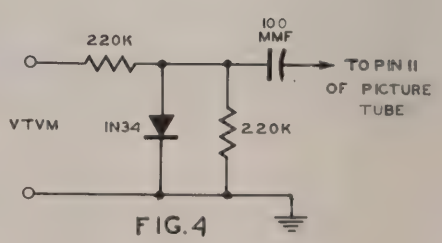
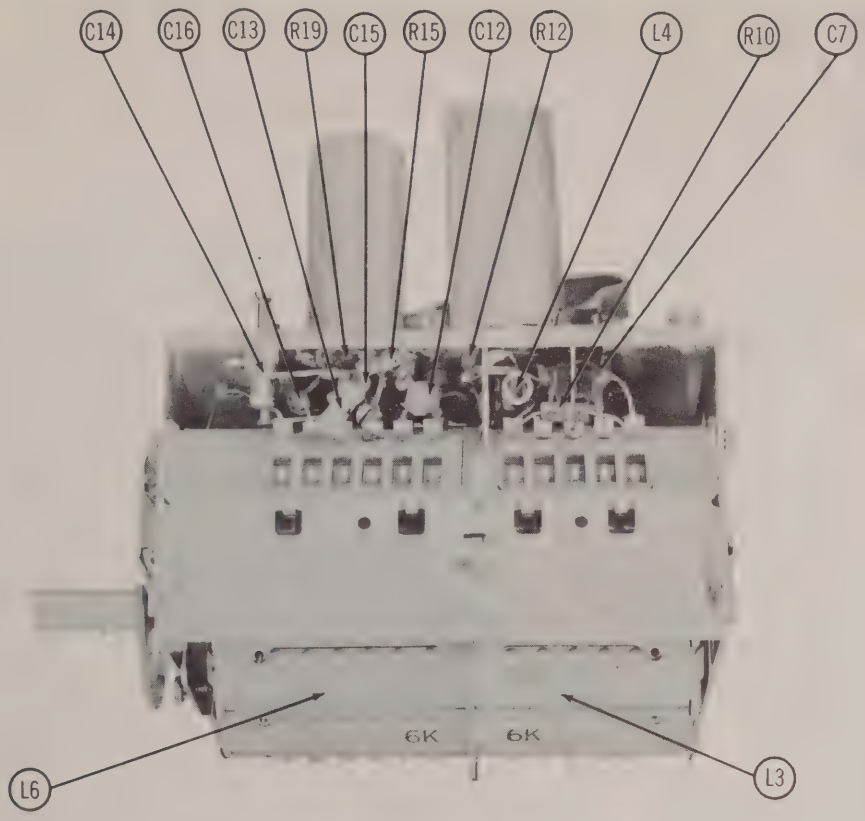
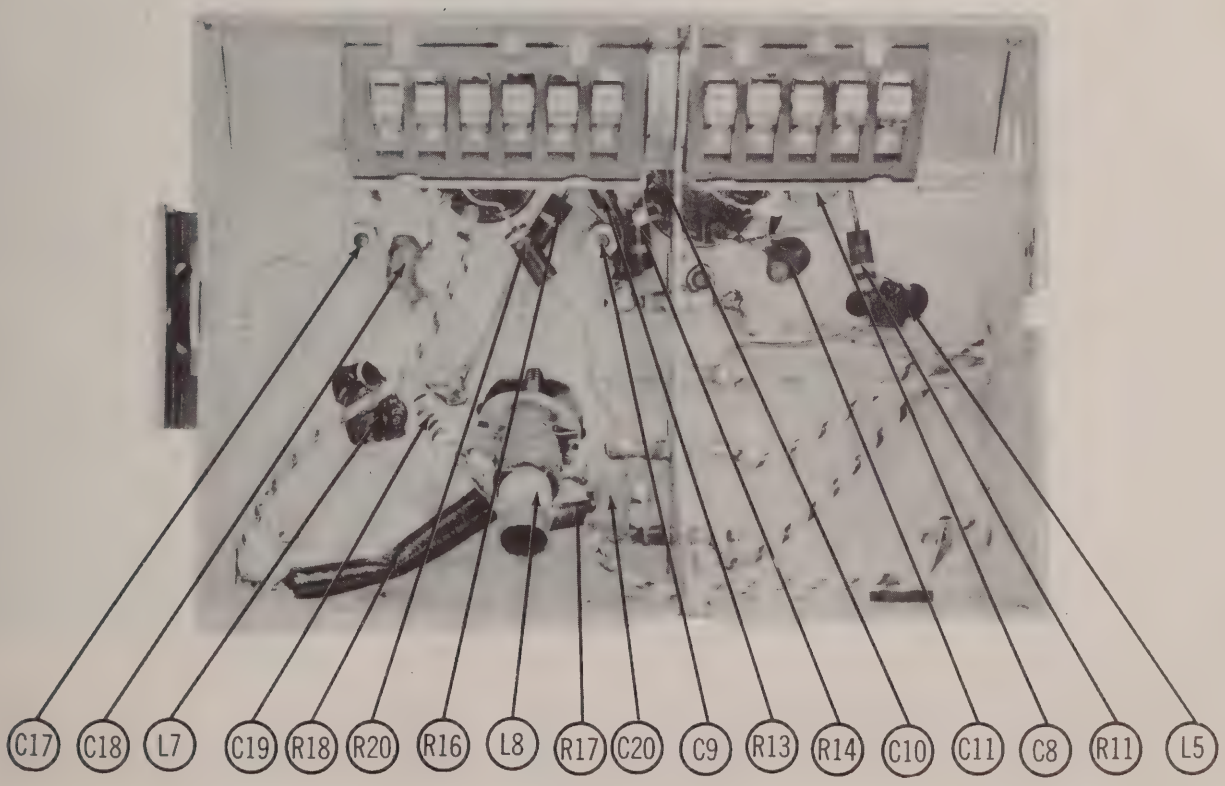


FIG. 4



RF TUNER-RIGHT SIDE

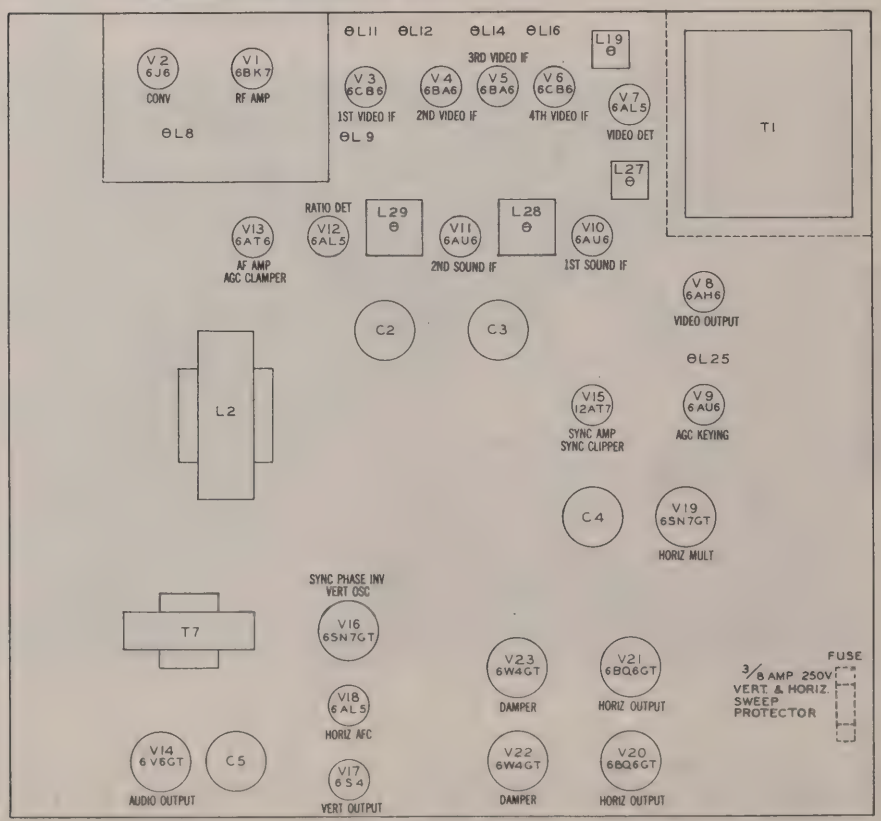


RF TUNER-BOTTOM VIEW

RESISTANCE MEASUREMENTS

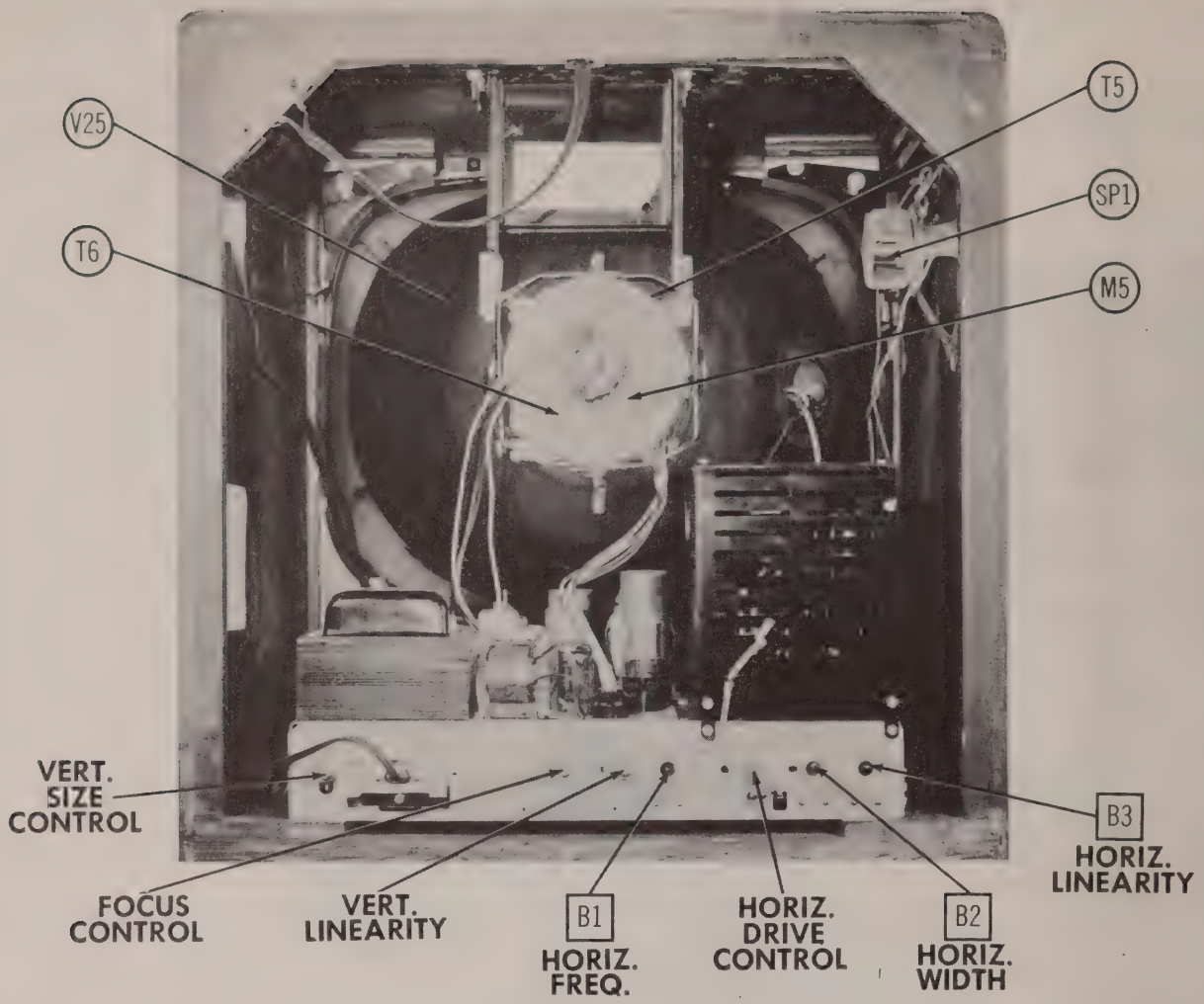
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BK7	INF	285KΩ	0Ω	.1Ω	0Ω	†3KΩ	†110KΩ	INF	0Ω
V 2	6J6	■10KΩ	■15KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6CB6	38KΩ	129Ω	0Ω	.1Ω	■208Ω	■208Ω	82Ω		
V 4	6BA6	95KΩ	0Ω	0Ω	.1Ω	■208Ω	■208Ω	100Ω		
V 5	6BA6	94KΩ	0Ω	0Ω	.1Ω	■208Ω	■208Ω	100Ω		
V 6	6CB6	2.8Ω	120Ω	0Ω	.1Ω	■308Ω	■208Ω	0Ω		
V 7	6AL5	0Ω	3.9KΩ	0Ω	.1Ω	2.8Ω	0Ω	4.7Meg		
V 8	6AH6	3.9KΩ	0Ω	0Ω	.1Ω	■5.7KΩ	■8.1KΩ	0Ω		
V 9	6AU6	■62KΩ	■108Ω	0Ω	.1Ω	120KΩ	#68KΩ	■108Ω		
V 10	6AU6	670KΩ	0Ω	.1Ω	0Ω	■1.1KΩ	■1.1KΩ	82Ω		
V 11	6AU6	470KΩ	0Ω	0Ω	.1Ω	■1.1KΩ	■1.1KΩ	0Ω		
V 12	6AL5	INF	INF	0Ω	.1Ω	4.7KΩ	0Ω	4.7KΩ		
V 13	6AT6	6.8Meg	0Ω	0Ω	.1Ω	240KΩ	240KΩ	†270KΩ		
V 14	6V6GT	INF	.1Ω	†2.3KΩ	†2KΩ	470KΩ	740KΩ	0Ω	390Ω	
V 15	12AT7	†18KΩ	■16KΩ	■100KΩ	.1Ω	.1Ω	■22KΩ	■2.2Meg	0Ω	0Ω
V 16	6SN7GTA	4.7Meg	†3.8KΩ	3.3KΩ	1.4Meg	#1Meg	0Ω	0Ω	.1Ω	
V 17	6S4	INF	1.1KΩ	2.2Meg	.1Ω	0Ω	2.2Meg	INF	INF	#5.7KΩ
V 18	6AL5	22KΩ	22KΩ	.1Ω	0Ω	4.8Meg	0Ω	4.8Meg		
V 19	6SN7GT	5.1Meg	#15KΩ	1KΩ	130KΩ	#210KΩ	1KΩ	0Ω	.1Ω	
V 20	6BQ6GT	INF	0Ω	200Ω	†18KΩ	470KΩ	INF	.1Ω	83Ω	TOP CAP #132Ω
V 21	6BQ6GT	INF	0Ω	INF	†18KΩ	470KΩ	470KΩ	.1Ω	83Ω	TOP CAP #132Ω
V 22	6W4GT	INF	INF	270KΩ	INF	†547Ω	INF	#0Ω	#.1Ω	
V 23	6W4GT	INF	INF	270KΩ	#68K Ω	†547Ω	INF	#0Ω	#.1Ω	
V 24	1B3GT	PINS 1 - 8 HAVE INF RESISTANCE								TOP CAP #275Ω
y 25	20CP4A	.1Ω	400KΩ	PIN 10 #69KΩ	PIN 11 ■160KΩ	PIN 12 0Ω				

ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM OUTPUT OF M1
# MEASURED FROM PINS 3 OF V22 & V23
■ MEASURED FROM JUNCTION OF C2B & L2.



BOTTOM VIEW

TUBE PLACEMENT CHART



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Set the horizontal hold control at the mid-position of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally.

Set the horizontal drive control at its maximum clockwise position without the presence of vertical white lines in the center of the picture.

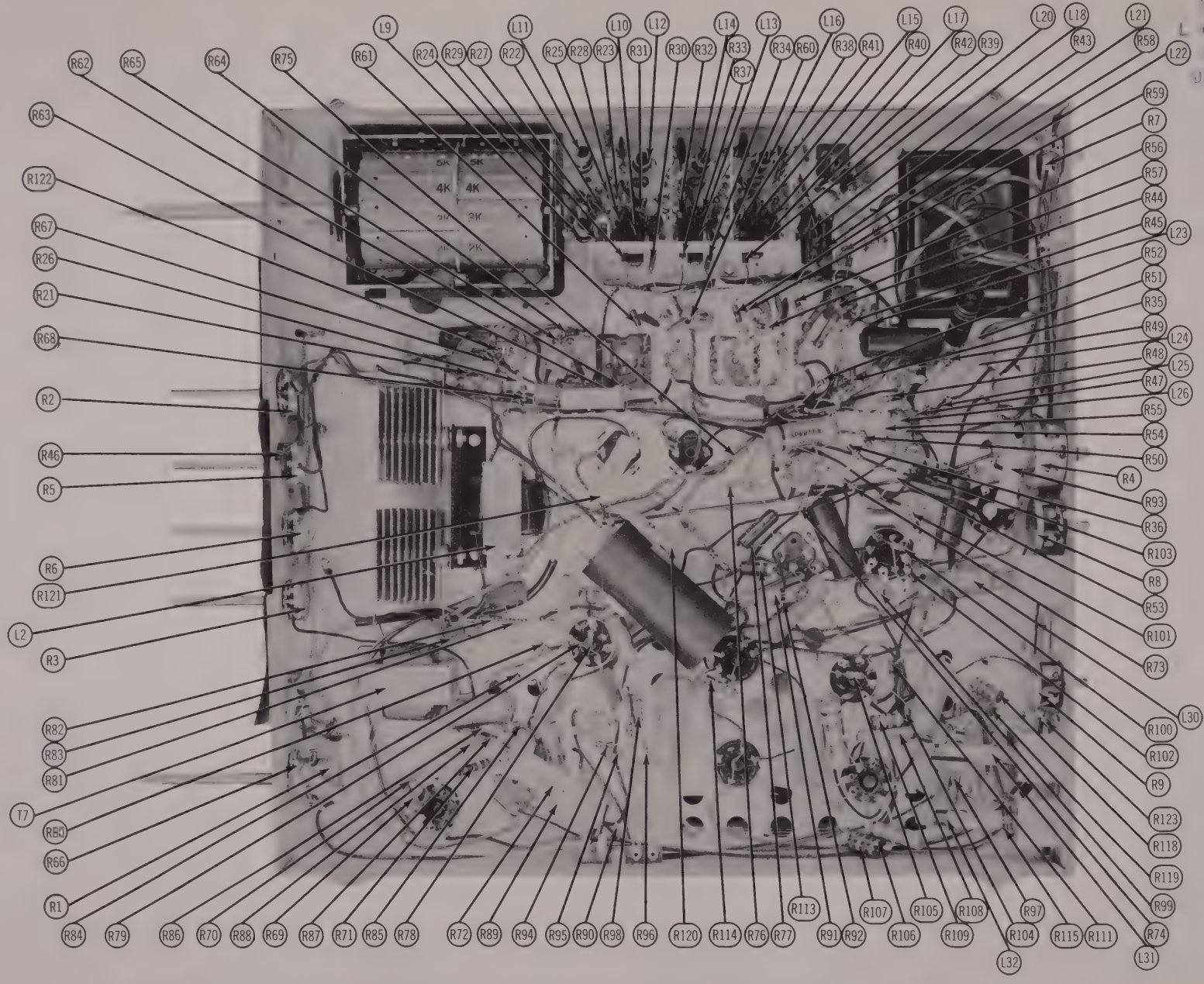
Adjust the width control slug (B2) for a picture slightly wider than enough to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B3) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 4 push on type control knobs from front panel.
2. Remove 10 wood and 1 metal screws. Remove rear cover.
3. Disconnect built in antenna. Remove 2 wood screws. Remove antenna bracket.
4. Disconnect speaker, HV lead, focus & deflection plug, and Crt. socket.
5. Remove 2 speaker nuts. Remove speaker.
6. Remove 4 chassis bolts. Remove chassis.

Note
FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: SPARTON Part No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	RF Amplifier		6BK7	9AJ	
V2	Converter		6J6	7BF	
V3	1st. Video IF Amp.		6CB6	7CM	
V4	2nd. Video IF Amp.		6BA6	7BK	
V5	3rd. Video IF Amp.		6BA6	7BK	
V6	4th. Video IF Amp.		6CB6	7CM	
V7	Video Detector Sync Clamper		6AL5	6BT	
V8	Video Output		6AH6	7BK	
V9	AGC Keying		6AU6	7BK	
V10	1st. Sound IF Amp.		6AU6	7BK	
V11	2nd. Sound IF Amp.		6AU6	7BK	
V12	Ratio Detector		6AL5	6BT	
V13	AF Amp.-AGC Clamp		6AT6	7BT	
V14	Audio Output		6V6GT	7AC	
V15	Sync Amplifier-Sync Clipper		12AT7	9A	
V16	Sync Phase Inv.-Vert. Oscillator		6SN7GT	8BD	
V17	Vert. Output		6S4	9AC	
V18	Horiz. AFC.		6AL5	6BT	
V19	Horiz. Mult.		6SN7GT	8BD	
V20	Horiz. Output		6BQ6GT	6AM	
V21	Horizl Output		6BQ6GT	6AM	
V22	Damper		6W4GT	4CG	
V23	Damper		6W4GT	4CG	
V24	HV Rectifier		1B3GT	3C	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: SPARTON Part No.	SYLVANIA Part No.	RTMA BASE TYPE	NOTES
V25A	20CP4A	20CP4A	12D	
B	20DP4A	20DP4A	12D	
C	21EP4A	21EP4A	12D	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C1	150	250	PA4309-4	AFH4-41		UPE12535		FP229.3	TVL-1540	
C2A	▲150	250	PA4307-31	AFH4-43		UPE12535		FP335	TVL-2532	
B	▲40	250				BR4025A				
C3A	▲40	250	PA4307-25	AFH3-54		UPT44150			TVL-4817	
B	▲40	475								
C	▲10	250								
C4A	▲40	475	PA4307-22	AFH4-124		UPT222245		FP476	TVL-3843	
B	▲20	450								
C	▲20	450								
C5A	▲100	50	PA4307-23	AFH4-87		UP8045C			TVL-2710	
B	▲80	450				BR8501			TVA-1310	
C	▲20	50								
C6	5	50	PA4308-2	PRS150/4		BR550		TC30	TVA-1303	
C7	3.2				TCZ-3.2		NP0K-2R2		5TCCB-V22	
C8	3-9				829-10					
C9	.5-3				829-3			CT565A		
C10	800			BPD-0008	DD-801	TM5T8	801-001	DC-521	5HK-D1	
C11	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C12	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C13	100			SI100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C14	.5-3				829-3			CT565A		
C15	30			SI20NP0	TCZ-30		NP0K-200	ZT-542	5TCC-Q3	
C16	10			SI10N750	TCN-10		N750K-100	NT-541	5TCU-Q1	
C17	.5-3				829-3			CT565A		
C18	1000			BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	10			SI10NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C20	120			SI120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C21	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C22	6.8		PA4328-13	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-U68	
C23	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C24	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C25	3.3		PA4326-4		TCZ-3.3		NP0K-3R3	ZT-5533	5TCCB-V33	
C26	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C27	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C28	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C30	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C31	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C32	.47	200	PC42DK-474	P288-47		PJ2P5		PT405	2TM-P47	
C33	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C36	1000		HK36M-102	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C37	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C38	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C39	270		HK36M-271	SI270	D6-271		GP2K-271	UC-5327	5GA-T27	
C40	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C41	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C42	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C43	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C44	6.8		PA4328-13	SI6.8NP0	TCZ-6.8		NP0K-6R8	ZT-5568	5TCCB-V68	
C45	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C46	4.7		PA4328-11	SI4.7NP0	TCZ-4.7		NP0K-4R7	ZT-5547	5TCCB-V47	
C47	47		CC30A-470F		TCZ-47		NP0L-470		5TCC-Q47	
C48	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C49	.001	600	PC42GM-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C50	.1	600	PC40GM-104	P688-1	DF-104	PTE6P1		PT601	6TM-P1	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON Part No.	AEROVOX Part No.	CENTRALAB Part No.	CORNELL-DUBILIER Part No.	ERIE Part No.	MALLORY Part No.	SPRAGUE Part No.	NOTES
C51	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C52	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C53	2.2		PA4326-1		TCZ-2.2		NP0K-2R2		5TCCB-V22	
C54	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C55	100		PA4332-3	SI100NP0	TCZ-100		NP0-333-101	ZT-531	5TCC-T1	
C56	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C57	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C58	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C59	33	600	MC30E-330		D6-330		GP1K-330			
C60	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C61	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C62	120		PA4332-4		TCZ-120		NP0-333-121		5TCC-T12	
C63	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C64	1000		HK36M-102	SI1000	D6-102	TM5D5	GP2L-102	UC-521	5HK-D1	
C65	.02	400	PC40HL-203	P488-02	DF-203	PTE4S2		PT412	4TM-S2	
C66	.01	400	PC40HL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C67	.02	600	PC40HM-203	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C68	.005	600	PC40GM-502	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C69	.03	300	PC40GK-303	P488-03		PTE4I3		PT413	6TM-S3	
C70	68	500	MC60E-680	1469-00007	D6-680	5R5Q7	GP1K-680		MS-47	
C71	.47	200	PC42DK-474	P288-47		PJ2P5		PT405	2TM-P47	
C72	.05	600	PC40GM-503	P688-05	DF-503	PTE6S5		PT615	6TM-S5	
C73	.001	600	PC42GM-102	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C74A	.002		PA4339-4	P688-002	D6-202	PTE6D2	GP2-333-202	PT622		
B	.005			P688-005	D6-502	PTE6D5	GP2-333-502	PT625	34C17	
C	.005			P688- 005	D6-502	PTE6D5	GP2-333-502	PT625		
C75	4700	500	M961F-472	1464-005		1DR5D5		MCB465	MS-25	
C76	2000	500	MC61E-202	1464-002		1R5D2		MCB457	MS-22	
C77	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C78	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C79	.1	400	PC40GL-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C80	.1	400	PC42GL-104	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C81	.003	600	PC40GM-302	P688-003	D6-302	PTE6D3	GP2-333-302	PT623	6TM-D3	
C82	1000	500	MC61E-102	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C83	1000	500	MC61E-102	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C84	.01	400	PC40FL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT401	4TM-S1	
C85	5100	500	MC61E-512			1DR5D4		MCB463		
C86	.05	200	PC40GK-503	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C87	3900	500	MC83F-392	1464-004		1DR5D4		MCB463		
C88	220	500	MC60E-221	1469-00025		5R5T25		MCB240		
C89	390	500	MC60E-391	1469-0004		5R5T4		MCB243	MS-34	
C90	270	500	MC60E-271	1469-0003		5R5T3		MCB241	MS-33	
C91	.01	400	PC40GL-103	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C92	.05	400	PC40HL-503	P488-05	D6-102	PTE4S5		PT415	4TM-S5	
C93	.25	200	PC40GK-254	P488-25		PTE4P25		PT4025	2TM-P25	
C94	.25	400	PC40GL-254	P488-25		PTE4P25		PT4025	4TM-P25	
C95	.1	400	PC40GL-104	P488-1		PTE4P1		PT401	4TM-P1	
C96	.1	400	PC40GL-104	P488-1		PTE4P1		PT401	4TM-P1	
C97	500	20000	PA4342-2	HV20C	TV3-502	MM-C20T5	413-501		20DK-T5	
C98	5000		PA4334-1	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C99	.047	600	PA4346-1			PJ6S47		PT6147	6TM-S47	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON Part No.	IRC Part No.	CLAROSTAT Part No.	CENTRALAB Part No.	MALLORY Part No.	INSTALLATION NOTES
R1A	1 Meg	½	PA-4450-1	QJ-180*	RTV-318		UF16L	Tone-Panel
B	330KΩ	½					UR354-T74	Volume-Tapped ② 75KΩ-Rear
C	Switch						US-27	Attach to R1B-Note 2
R2A	25KΩ	½	PA-4442-4	QII-120	AG-40-S	B-29	U-29	Contrast
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
R3A	500KΩ	½	PA-4451-1	QII-133	AG-58-S	B-59	U-50	Vert Hold-Note 1.
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
R4A	1500Ω	4	PA-4426-1		A10-1500	SVP-994	TVF140	Focus-Wire Wound
B	Shaft		Not Req.		FKS 1/4	Not Req.	Not Req.	Attach to R4A.
R5A	100KΩ	½	PA-4445-2	QII-128	AG 49-S	B-40	U 41	Brightness
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R5A
R6A	50KΩ	½	PA-4444-2	QII-123	AG-44-S	B-31	U-35	Horiz. Hold
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R6A
R7A	2.5Meg.	½	PA-4431	QII-239	AG-84-A	AB-83	SU-565	Vert Size
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R7A
R8A	5000Ω	2	PA-4411	W-5000	A43-5000	VK-135	R5000L	Vert Linearity-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R8A
R9A	1000Ω	2	PA-4446	WK-1000	A43-1000	VK-129	R1000L	Horiz. Drive-Wire Wound
B	Shaft		Not Req.	Not Req.	FKS-1/4	Not Req.	Not Req.	Attach to R9A

Note 1. Some models use alternate control (Part #PA-4443-2)
Note 2. This is a DPST switch, both sections used in Models 5296A & 5297A
* CONCENTRIKIT EQUIVALENT - KIT K-2, BASE ELEMENTS & SHAFTS B11-137 & P1-229 (Panel), B18-132X & R1-312 (Rear) & SWITCH 76-2

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: SPARTON Part No.	IRC Part No.	NOTES
R10	22KΩ				
R11	47KΩ20%				
R12	220KΩ20%			BTS-220K	
R13	1000Ω20%			BTS-1000	
R14	180KΩ			BTS-180K	
R15	4700Ω			BTS-4700	
R16	2200Ω20%			BTS-220K	
R17	15KΩ20%			BTS-15K	
R18	10Ω				
R19	10KΩ			BTS-10K	
R20	10KΩ			BTS-10K	
R21	100Ω20%			BTS-100	
R22	3600Ω5%			BTS-3600-5%	
R23	1000Ω20%			BTS-1000	
R24	33KΩ			BTS-33K	
R25	56KΩ			BTS-56K	
R26	150KΩ			BTS-150K	
R27	47Ω5%				
R28	82Ω5%			BTS-82-5%	
R29	100Ω20%			BTS-100	
R30	1000Ω20%			BTS-1000	
R31	4700Ω5%				BTS-4700-5%
R32	100Ω5%				BTS-100-5%
R33	100Ω20%				BTS-100
R34	1000Ω20%				BTS1000
R35	15KΩ5%				BTS-15K5%
R36	27KΩ				BTS-27K
R37	3300Ω5%				BTS-3300-5%
R38	100Ω5%				BTS-1005%
R39	100Ω20%				BTS-100
R40	4300Ω5%				BTS-4300-5%
R41	120Ω				BTS-120
R42	100Ω20%				BTS-100
R43	100Ω20%				BTS-100
R44	3900Ω5%				BTS-39005%
R45	6800Ω				BTS-3900-5%
R46	27KΩ				BTS-27K
R47	5600Ω5%				BTA-5600-5%
R48	10KΩ				BTS-10K
R49	220KΩ				BTS-220K
R50	1000Ω				BTS-1000
R51	470KΩ				BTS-470K

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: SPARTON Part No.	IRC Part No.	NOTES
R52	330KΩ20%			BTS-330K	
R53	6800Ω5%			BTA-6800-5%	
R54	47KΩ			BTS-47K	
R55	2.2Meg.			BTS-2.2Meg.	
R56	100KΩ			BTS-100K	
R57	82Ω			BTS-82	
R58	1000Ω20%			BTS-1000	
R59	100KΩ20%			BTS-100K	
R60	470KΩ				
R61	1000Ω20%			BTS-1000	
R62	150Ω5%			BTS-150-5%	
R63	47KΩ			BTS-47K	
R64	4700Ω5%			BTS-4700-5%	
R65	4700Ω5%			BTS-4700-5%	
R66	10KΩ			BTS-10K	
R67	6.8Meg.			BTS-6.8Meg.	
R68	270KΩ			BTS-270K	
R69	270KΩ			BTS-270K	
R70	470KΩ			BTS-470K	
R71	390Ω	1		BTA-390	
R72	1500Ω	10		1 3/4A-1500	
R73	100KΩ			BTS-100K	
R74	18KΩ			BTS-18K	
R75	2.2Meg.			BTS-2.2Meg.	
R76	22KΩ			BTS-22K	
R77	4.7Meg.			BTS-4.7Meg.	
R78	3300Ω5%			BTS-3300-5%	
R79	3300Ω5%			BTS-3300 -5%	
R80	15KΩ			BTS-15K	
R81	8200Ω			BTS-8200	
R82	8200Ω			BTS-8200	
R83	1.1Meg.5%		Note	BTS-1.1Meg.5%	Note
R84	100KΩ			BTS-100K	
R85	100KΩ			BTS-100K	
R86	6.8Meg.			BTS-6.8Meg.	
R87	100K			BTS-100K	
R88	47000				BTS-4700
R89	2.2Meg.				BTS-2.2Meg.
R90	390Ω				BTS 390
R91	10KΩ	2			BTS-10K
R92	10KΩ	2			BTS-10K
R93	280Ω	5			1 3/4A-300
R94	100KΩ				BTS -100K
R95	100KΩ				BTS-100K
R96	4.7Meg.				BTS-4.7Meg.
R97	22KΩ				BTA-22K
R98	470K				BTS-470K
R99	1000Ω5%				BTS-1000 -5%
R100	5600Ω5%				BTS-5600 -5%
R101	100KΩ				BTS-100K
R102	200KΩ5%				BTS-200K-5%
R103	10KΩ				BTS-10K
R104	100Ω				
R105	470K				BTS-470K
R106	120Ω	2			BW-2-120
R107	270Ω	1			BW-1-270
R108	33KΩ	2			BTB-33K
R109	39KΩ	2			BTB-39K
R110	100Ω20%				
R111	100Ω20%				
R112	100Ω20%				
R113	10KΩ	2			BTB-10K
R114	68KΩ	1			BTA-68K
R115	1500Ω5%	1			BTA-1500-5%
R116	5Ω				
R117	1Meg.				
R118	8200Ω	2			BTB-8200
R119	8200Ω	2			BTB-8200
R120	5Ω	5			
R121	300Ω	5			1 3/4A-300
R122	4.7Meg.				BTS-4.7Meg.
R123	39Ω				

Note-Some models use a 1Meg. resistor in this application.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: SPARTON Part No.	JENSEN Part No.	QUAM Part No.	NOTES
SP1	6"	PM	3.3Ω	PC-63000-43 PC-63000-42① PC-63000-41② PC-63000-12③	ST-106 Mod. P8-X	6A1	① Alternate 8" PM Speaker ② Alternate 10" PM Speaker ③ 10" Speaker used in models 5296A, 5297A and 5298.

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: SPARTON Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.
T1	117VAC ④ 2.06A	170VAC .100ADC	6.3VAC ④ 9.7A	6.3VAC ④ 2.3A	AB-44024-1		P-3076 ①		

① Use only ½ of high voltage winding

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: SPARTON Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.	NOTES
T2	150Ω	820Ω	AB47006-4	A-8111	A-3000	TBO-3	A-97X	Vert. Osc. Trans.
T3	270Ω Tap ② 27Ω	8.5Ω Tap ④ 4Ω	PC70012		HVO-7		D-15	Horiz. Output Trans.
		SEC. 2 30						
		SEC. 3 0Ω						
T4	700Ω	6.5Ω	AB44062-7		A-3080 ③		TA-105X	Vert. Output Trans.
T5A	12Ω		PC70013	DY-8	MDF-70	TY-2	Y-12	Horiz. Deflection Coils
B	63Ω		PC70017 ①					Vert. Deflection Coils
T6	435Ω		PC70008-1C PC70008-1 ②	FC-11 ④	MF-2 ④	TC-2	B-470-R ③	Focus Coil

① Use with 21" picture tube.
② Alternate focus coil
③ Drill new mtg holes
④ Fabricate new mtg. bracket

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SPARTON Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.	NOTES
T7	6.4KΩ	3.4Ω	270Ω	.4Ω	AB-44066-3	A-3823	A-3020	RO-13 ①	S-9Z	① Drill one new mtg. hole.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA: SPARTON Part No.	STANCOR Part No.	MERIT Part No.	CHICAGO Part No.	TRIAD Part No.
L1	.200A	108Ω	3Hy	AB-47009-1	C-2327	C-2994	TR-3300	C-15X
L2	.095Ω	108Ω	3Hy	AB-47009-1	C-2327	C-2994	TR-3300	C-15X

PARTS LIST CONTINUED ON PAGE 15

SPARTON MODELS 5288, 5289, 5291, 5292, 5293, 5294, 5295, 5296A, 5297A, 5298

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	SPARTON PART No.	MERIT PART No.	
L3	Ant. Coils	0Ω				
L4	RF Choke	0Ω				
L5	Fil. Choke	0Ω				
L6	RF Mixer Grid & Osc. Coils	0Ω				
L7	Fil. Choke	0Ω				
L8	1st. Video IF	.8Ω				
L9	21.75MC Trap	0Ω		AB43523-12	TV-112	
L10	Fil. Choke	0Ω		AA6651-1		
L11	27.75MC	0Ω		AB43523-13		
L12	2nd. Video IF	.1Ω		AA6408-1	TV-102	
L13	Fil. Choke	0Ω		AA6651-1		
L14	3rd. Video IF	.1Ω		AA6408-1	TV-102	
L15	Fil. Choke	0Ω		AA6651-1		
L16	4th. Video IF	.1Ω		AA6408-1	TV-103	
L17	RF Choke	2.8Ω		AA6650-1		
L18	Fil. Choke	0Ω		AA6651-1		
L19	5th. Video IF	.4Ω		AA6364-1		
L20	RF Choke	2.8Ω		AA6650-1		
L21	Fil. Choke	0Ω		AA6651-1		
L22	Peaking Coil	8.1Ω		AA6402-6		146 Microhenries, wound on 4.7KΩ resistor
L23	Peaking Coil	17Ω		AA6613-8	TV-188	600 Microhenries
L24	Peaking Coil	9.6Ω		AA6402-7	TV-184	213 Microhenries, wound on 6.8KΩ resistor
L25	4.5MC Trap	1.9Ω		AA6407-1	TV-151	
L26	Peaking Coil	14Ω		AA6613-10	TV-188	420 Microhenries
L27	1st. Sound IF	1.7Ω		AA6364-2		
L28	2nd. Sound IF	2Ω	2Ω	AA6667-5	TV-108	
L29	Ratio Det.	4.6Ω	1Ω CT.	AA6684-4	TV-110 *	Tertiary winding .4Ω
L30	Horiz. Osc.	60Ω		AA6403-2	TV-163	
L31	Width	6Ω		AA6400-3	MWC-2	
L32	Horiz. Lin.	5.5Ω		AA6400-3	MWC-2	

* Drill new mtg. holes.

SELENIUM RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT	SPARTON PART No.	SYLVANIA PART No.	SELETRON PART No.	FEDERAL PART No.	MALLORY PART No.	
M1	.200A	9S2L	NH5	5S1	1021	6S350	
M2	.300A	9S2L	NH5	5S1	1021	6S350	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			SPARTON PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	3AG	3/8 A. 250V.	PA4212-3		318.375 (3AG-P/T)		GJV 3/8	

MISCELLANEOUS

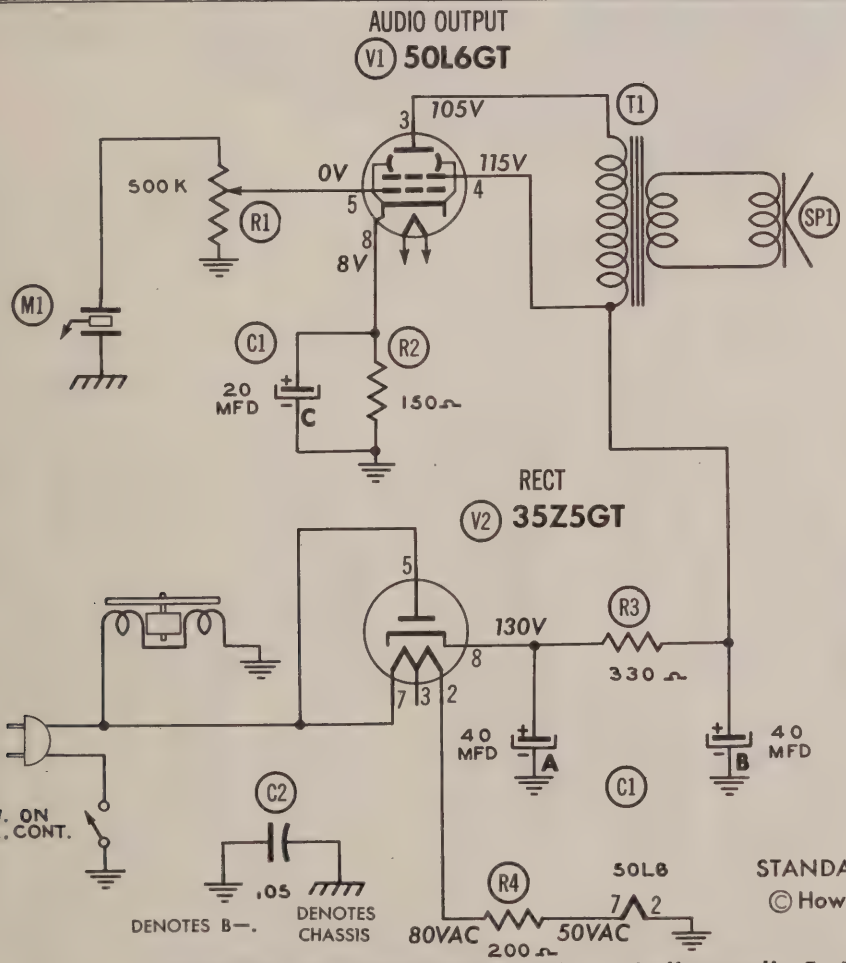
ITEM No.	PART NAME	SPARTON PART No.	NOTES
M4A	RF Tuner	PD93158	
B	RF Tuner	PD93159	
M5A	Ion Trap	PA1248-2	
B	Ion Trap	PA1248-1	
M6	Magnet	PC63119	Anti-Pin Cushion Correction unit (Model 5298 only)
	Knob	PA5651	Vert. & Horiz. hold, Brightness & contrast
	Knob	PB40329	On/off Volume
	Knob	PB40347	Tone
	Knob	PB40332	Channel Selector
	Knob	PB40346	Fine Tuning
	Sparton Script	PA5842	Mounts on control cover
	Control cover Assy	AB43582-1	
	Mask	PD93042	
	Mask	PC63116	Model 5298 only
	Bezel	PC63117	Model 5298 only
	Safety Glass	BP93041	
	Safety Glass	PD93041-1	Model 5297A only
	Safety Glass	PC63118	Model 5298 only
	Safety Screen	PB40209-11	Model 5288
	Safety Screen	PB40209-12	Model 5292 & 5293

STEELMAN MODEL 107

PROPERTY OF
L. F. BLANKENSHIP
3934 MEADE ST.
DENVER, COLORADO

STEELMAN
MODEL 107

TRADE NAME	Steelman Model 107
MANUFACTURER	Steelmen Phono & Radio Co., Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Audio Amplifier With Single Speed Manual Record Player
TUBES (TWO)	Types 50L6GT Audio Output, 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.260 Amp. @ 117 Volts AC



Pin No.	V1-50L6GT Res.	V2-35Z5GT Res.
1	INF	INF
2	0Ω	250Ω
3	†498Ω	267Ω
4	†330Ω	INF
5	0Ω	285Ω
6	INF	†330Ω
7	50Ω	285Ω
8	150Ω	30KΩ

† MEASURED FROM PIN 8 OF V2

THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	Audio Output	50L6GT	50L6GT	7AC	
V2	Rectifier	35Z5GT	35ZGT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	40	150		PRS150/50-30-20		EDL44215		3N532	TVA-3448	
B	40	150								
C	20	150								
C2	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	VC1005	Q13-133	AG-60-Z	B-60-S	U-48	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R1A

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	150Ω	½		BTS-150	
R3	330Ω	1		BTA-330	
R4	200Ω	1			

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: PART No.	REPLACEMENT DATA: IRC PART No.	NOTES

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	2KΩ	2.6Ω	168Ω	.42Ω	P-70-D	A-2928①	A-3332 ①	R0-2 ①	A-2X ①	① Bend mtg. tabs down file out slots, mount on original mounting bracket.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	NOTES
SP1	4"	PM	2.6Ω	Sp-45	ST-113 Mod. P-4X	4A07	

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	ASTATIC PART No.: CARTRIDGE	ASTATIC PART No.: NEEDLE	SHURE PART No.: CARTRIDGE	SHURE PART No.: NEEDLE	ELECTRO-VOICE PART No.: CARTRIDGE	ELECTRO-VOICE PART No.: NEEDLE	REMARKS
M1		L 82 ♦507-L82	Optional	W56A *96A	Optional	60 *2500	Optional	* Tone Arm ♦ Complete arm & cart. assby.

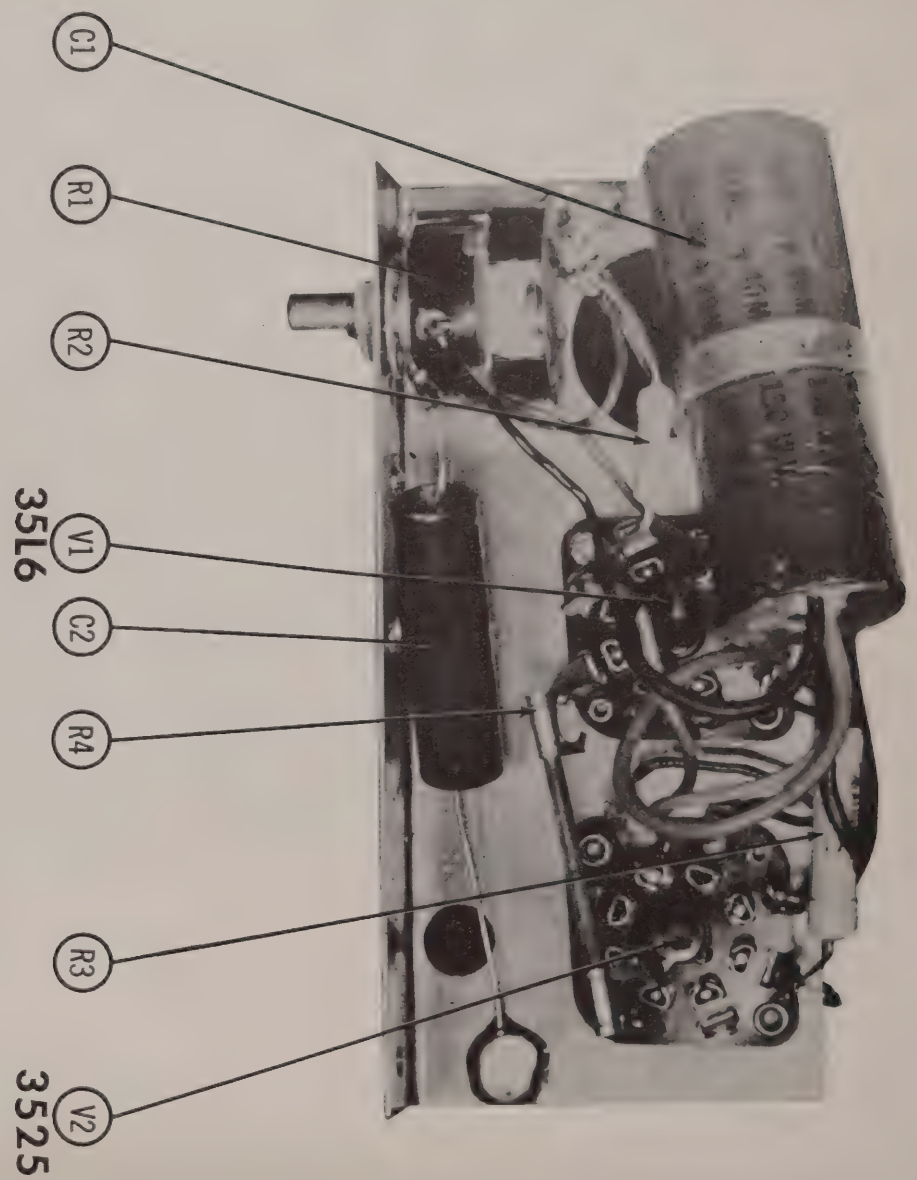
ASTATIC, SHURE, AND ELECTRO-VOICE NEEDLE LISTING SHOWN ABOVE ARE SPECIFIED FOR THE RESTECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLES REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA: STEELMAN PART No.	WALCO PART No.	JENSEN PART No.	REMARKS
M2		WS-400	NY-153	

CHASSIS—TOP VIEW



STEELMAN
MODEL 357

STEELMAN
MODEL 357

TRADE NAME	Steelman Model 357
MANUFACTURER	Steelman Phono & Radio Co. Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated Audio Amplifier With 3 Speed Manual Record Player
TUBE (Three)	Types 7F7 AF Amp., 7C5 Audio Output, 7Y4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .33 Amp. @ 117 Volts AC

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PARTS LIST AND DESCRIPTIONS

STEELMAN MODEL 357

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: STEELMAN PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	AF Amplifier	7F7	7F7	8AC	
V2	Audio Output	7C5	7C5	6AA	
V3	Rectifier	7Y4	7Y4	5AB	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■30	300		AFH3-169		UP3330V2		FP331	TVL-3620	
B	▲25	300								
C	20	25								
C2	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C3	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C4	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C5	.005	600		P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C6	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C7	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	½	VC-55	Q11-133	AG-58-S	B-59	U-50	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A
R2A	500KΩ	½	VC-1005	Q13-133	AG-60-Z	B-60-S	U-48	Tone
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SWB	Not req.	Not Req.	Attach to R2A

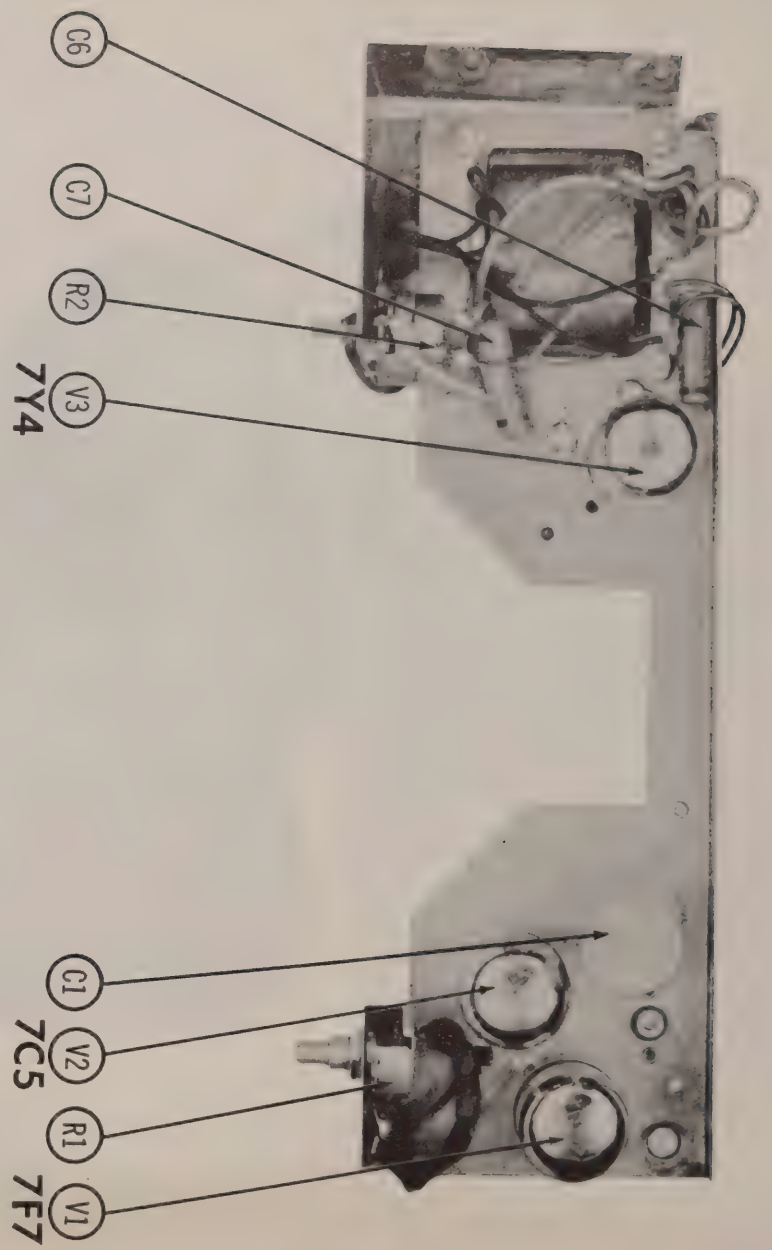
RESISTORS

ITEM No.	RATING OHMS	RATING WATTS	REPLACEMENT DATA: STEELMAN PART No.	IRC PART No.	NOTES
R3	4.7Meg	½		BTS-4.7 Meg	
R4	50KΩ	½			
R5	470KΩ	½		BTS-470K	
R6	330Ω	1		BTA-330	
R7	330Ω	5			

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA: STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC @ .33A	590VCT .049ADC	6.3VAC @ 1.22		310	PM-8407		PV-70A	R-5B

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T2	4.4KΩ	3.2Ω	525Ω	.63Ω	1024-9	A-3877 ①	A-3019 ①	RO-9 ①	S-5Z ①	① Bend mtg. tabs down, file out slots, and mount on orig. bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	6"	PM	3.2Ω	SP60	ST-108 Mod. P6-X	6A1	

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA				
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ∿)	STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.049A	210Ω	7.5 Hy.				R-650	C-3X

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA						REMARKS
	PART No.	ASTATIC PART No.		SHURE PART No.		ELECTRO-VOICE PART No.		
		CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	CARTRIDGE	NEEDLE	
M1		LQD-1J	Q Q-33			96	0-1 or S-1 & 0-3 or S-3	* Complete tone arm and cartridge assembly ♦ Tone Arm
		*7-D		♦901D		*2400		

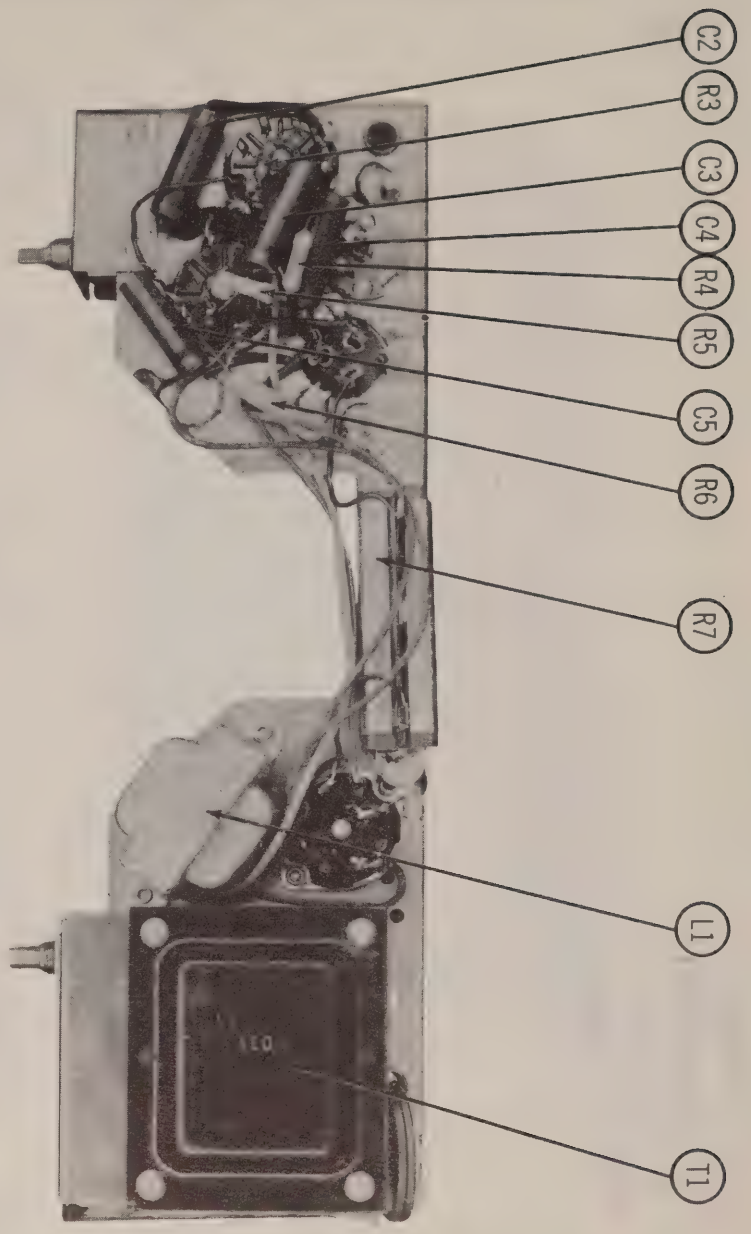
ASTATIC, AND ELECTRO-VOICE NEEDLE LISTINGS SHOWN ABOVE ARE SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGES LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

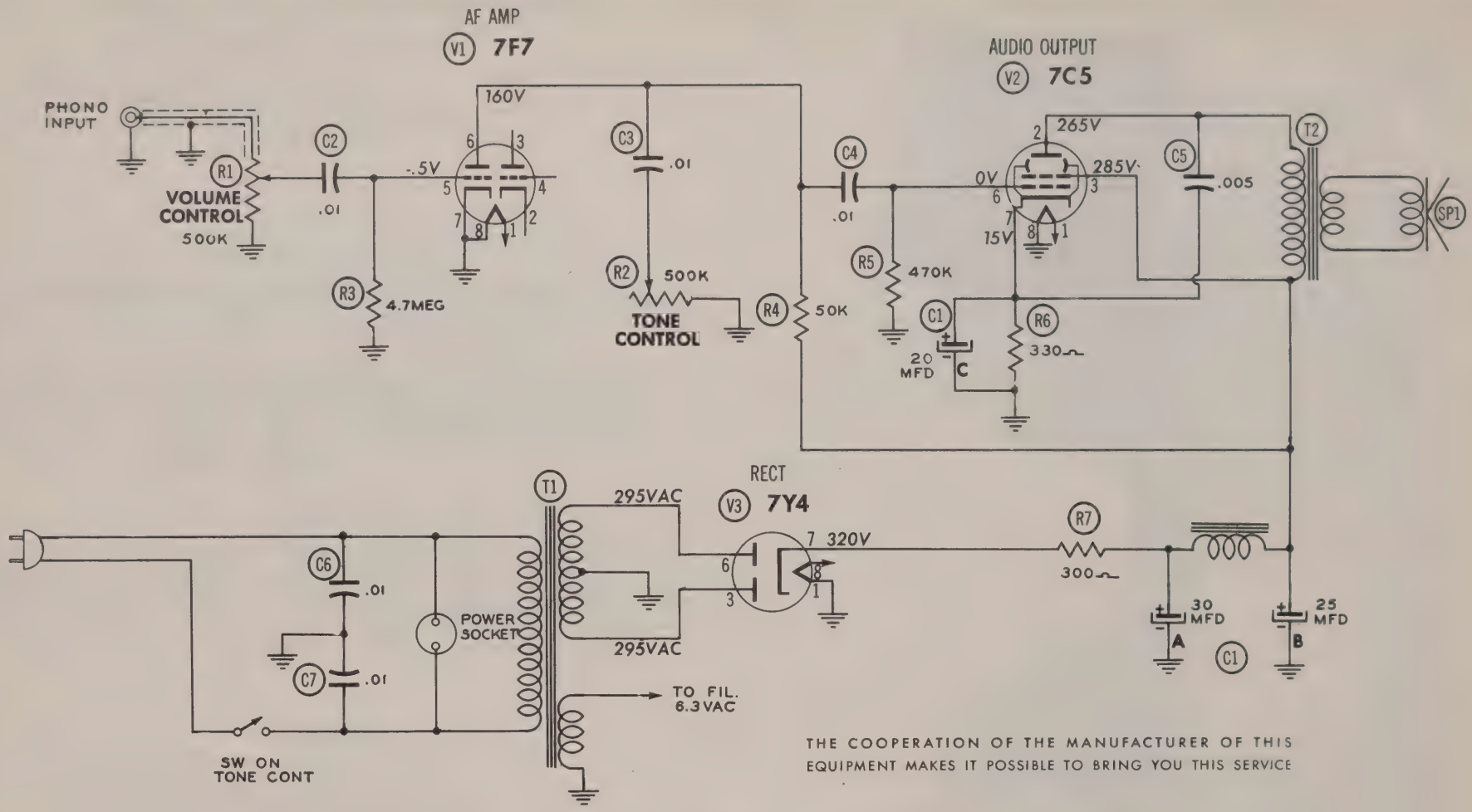
PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA			REMARKS
	STEELMAN PART No.	WALCO PART No.	JENSEN PART No.	
M2.		W-2A or W-2S & W-2MGA or W-2MGS	A-80 or A-81 & A-80LP or A-81LP	

CHASSIS—BOTTOM VIEW





THE COOPERATION OF THE MANUFACTURER OF THIS EQUIPMENT MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	7F7	.2Ω	INF	INF	INF	4.7Meg	†50KΩ	0Ω	0Ω
V 2	7C5	.2Ω	†1KΩ	†510Ω	0Ω	INF	470KΩ	330Ω	0Ω
V 3	7Y4	0Ω	INF	320Ω	INF	INF	345Ω	50KΩ	.1Ω

† MEASURED FROM PIN 7 OF V3.

A PHOTOFACT STANDARD NOTATION SCHEMATIC

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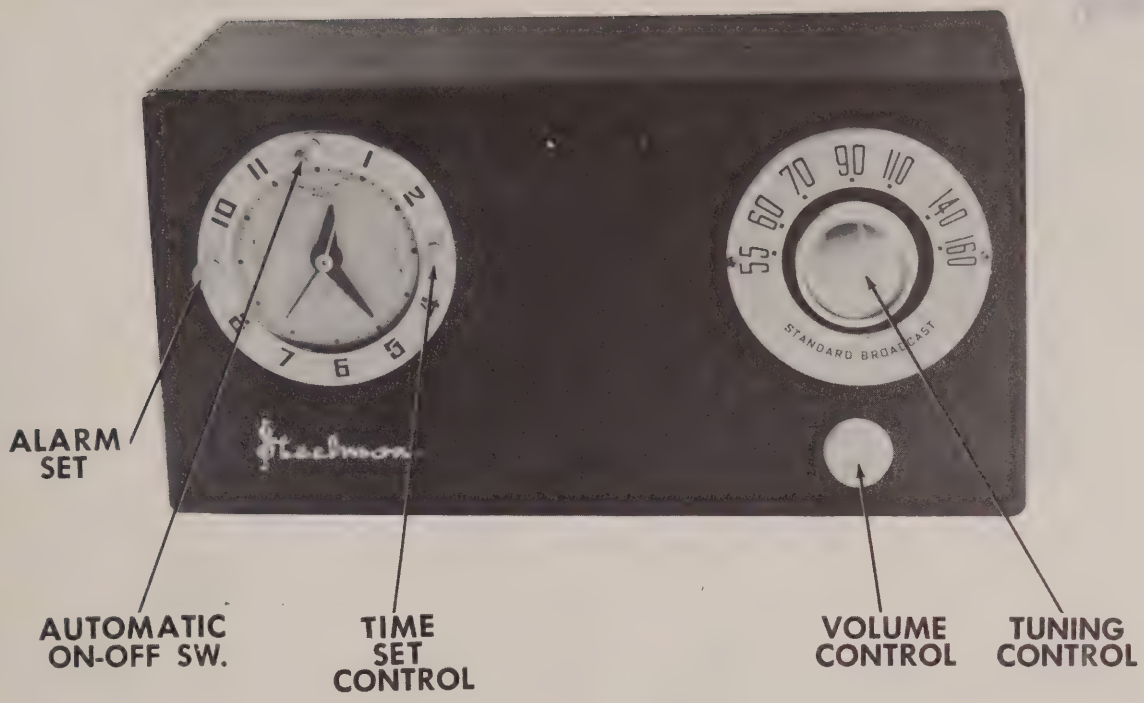
178-13

1. DC voltages measurements are at 20,000 ohms per volt, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 15% in voltage and resistance readings.
6. All controls at minimum, proper output load connected.

STEELMAN
MODELS 450, 451



STEELMAN
MODELS 450, 451

STEELMAN MODEL 450

TRADE NAME	Steelman Models 450, 451
MANUFACTURER	Steelman Phono & Radio Co. Inc., 12-30 Anderson Ave., Mt. Vernon, N.Y.
TYPE SET	AC Operated AM Superheterodyne Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Conv., 12BA6 IF Amp., 12AT6 Det.-AVC-AF Amp., 50C5 Audio Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycle RATING .250 Amp. @ 117 Volts AC
TUNING RANGE—BROADCAST	550-1600 KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1MFD	High side to pin 7 (grid) of 12BE6(V1). Low side to B-.	455 KC (400∿ Mod.)	Tuning g ang fully open.	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modulation.
2.	"	"	1600 KC	"	"	A5	"
3.		Loop	1400 KC	Tune to 1400 KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

After alignment replace receiver in cabinet, turn tuning gang fully open and set pointer at the "0" in "160".

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PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	NOTES
		STEELMAN PART No.	STANDARD REPLACEMENT		
V1	Converter	12BE6	12BE6	7CH	
V2	IF Amplifier	12BA6	12BA6	7BK	
V3	Det.-AVC-AF Amp.	12AT6	12AT6	7BT	
V4	Audio Output	50C5	50C5	7CV	
V5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	STEELMAN PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C1A	40	150		PRS150/50-30-20		EDL44215		3N532	TVA-3448	
B	40	150								
C	20	150								
C2	.05	400		P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C3	200	500		1468-0002	D6-201	5W5T2	GP2K-201	MC237	1FM-32	
C4	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C5	220	500		1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C6	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S5	
C7	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S5	
C8	.01	600		P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S5	
C9	.1	400		P488-1	DF-104	PTE4P1		PT401	4TM-P1	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	STEELMAN PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	
R1A	500KΩ	½	VC-25	Q13-133	AG-60-Z	B-60	U-48	Volume - See Note
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R1A

Note. Model #451 incorporates volume control and Sw. (Part VC1005).

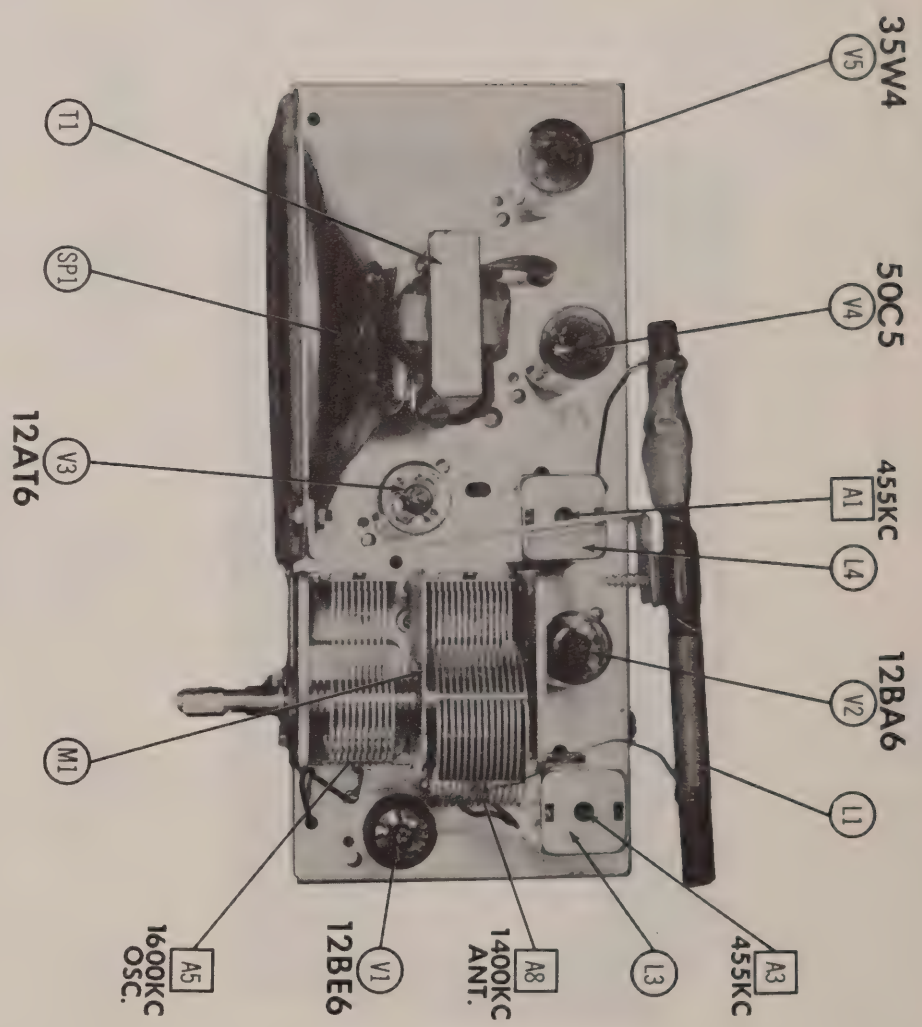
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATTS	STEELMAN PART No.	IRC PART No.	
R2	22KΩ	½		BTS-22K	
R3	220Ω	½		BTS-220	
R4	2.2Meg	½		BTS-2.2 Meg.	
R5	4.7Meg	½		BTS-4.7 Meg	See Note

ITEM No.	RATING		REPLACEMENT DATA		NOTES
	OHMS	WATTS	PART No.	IRC PART No.	
R6	220KΩ	½		BTS-220K	
R7	470KΩ	½		BTS-470K	
R8	150Ω	½		BTS-150	
R9	330Ω	1		BTA-330	
R10	2200Ω	1		BTA-2200	
R11	18Ω	½			

Note . Some models use a 10Meg resistor in this application.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	IMPEDANCE		DC RES.		STEELMAN PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	
	PRI.	SEC.	PRI.	SEC.						
T1	2KΩ	2.6Ω	168Ω	.42Ω	P-70-D	A-3332 ①	A-2928 ①	RO-2 ①	S-2X ①	① Bend mtg. tabs down, file out slots, mount on orig. mtg. bracket.

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	STEELMAN PART No.	JENSEN PART No.	QUAM PART No.	
SP1	4"	PM	2.6Ω	SP-45	ST-113 Mod. P4-X	4A07	

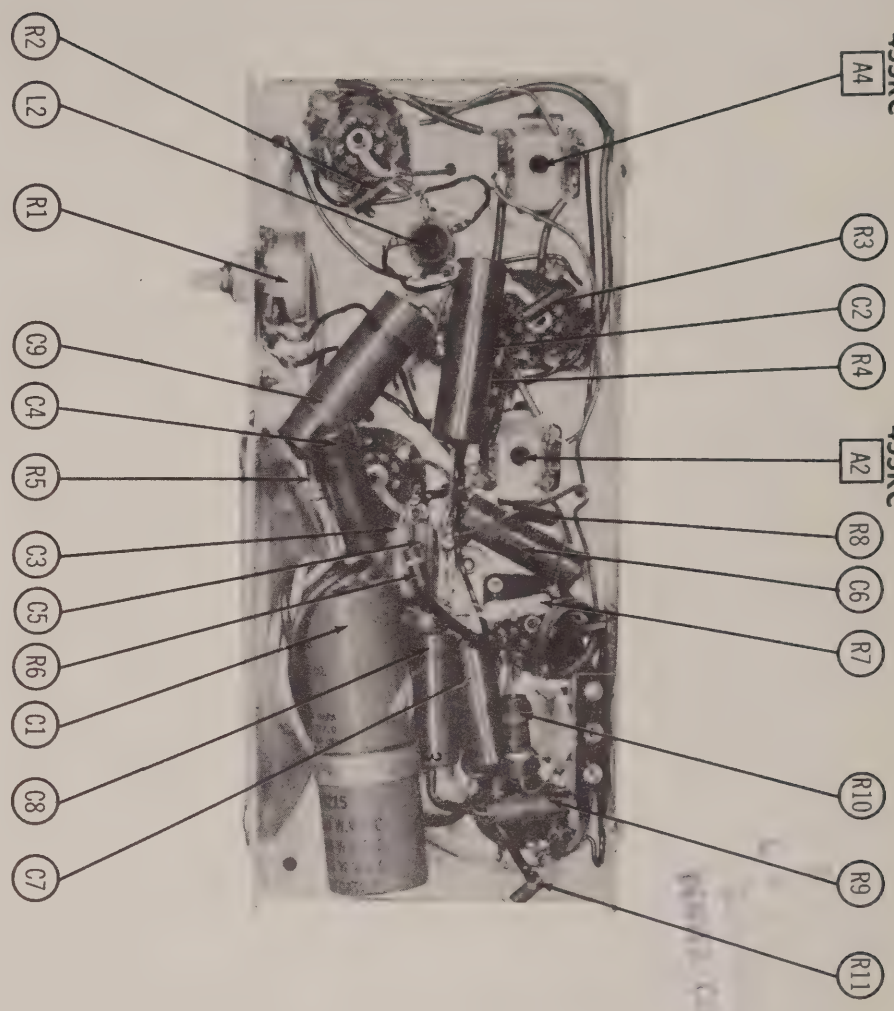
COILS (RF-IF)

ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	STEELMAN PART No.	MERIT PART No.	
L1	Loop Ant.	.3Ω				
L2	Osc. Coil	.4Ω	5.5Ω			
L3	Input IF	21Ω	22Ω	BC-352		
L4	Output IF	21Ω	22Ω	BC-353		

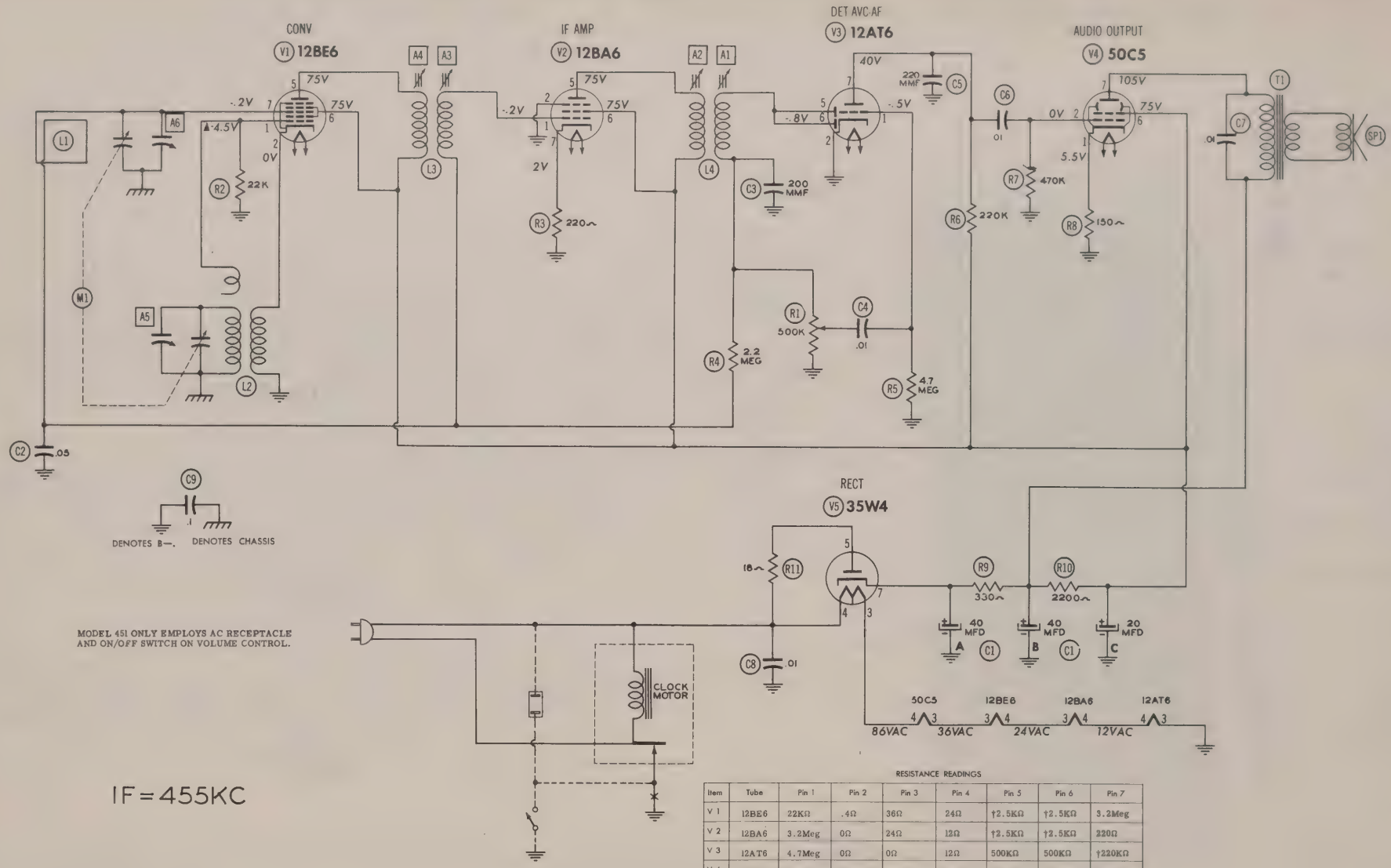
MISCELLANEOUS

ITEM No.	PART NAME	STEELMAN PART No.	NOTES
M1	2 Gang Var. Cap.		(42-477MMF, 34-207MMF)

CHASSIS—BOTTOM VIEW



STEELMAN MODEL 450



MODEL 451 ONLY EMPLOYS AC RECEPTACLE AND ON/OFF SWITCH ON VOLUME CONTROL.

IF = 455KC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V 1	12BE6	22KΩ	.4Ω	36Ω	24Ω	†2.5KΩ	†2.5KΩ	3.2Meg
V 2	12BA6	3.2Meg	0Ω	24Ω	12Ω	†2.5KΩ	†2.5KΩ	220Ω
V 3	12AT6	4.7Meg	0Ω	0Ω	12Ω	500KΩ	500KΩ	†220KΩ
V 4	50C5	150Ω	470KΩ	36Ω	86Ω	470KΩ	†2.5KΩ	†500Ω
V 5	35W4	†330	INF	86Ω	121Ω	139Ω	103Ω	40KΩ

† MEASURED FROM PIN 7 OF V5.
▲ TAKEN WITH VACUUM TUBE VOLTMETER

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178-14

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

STROMBERG-CARLSON MODELS 417C5-M, 417C5-O, 417C5-Dec, 417TX (Series 417)

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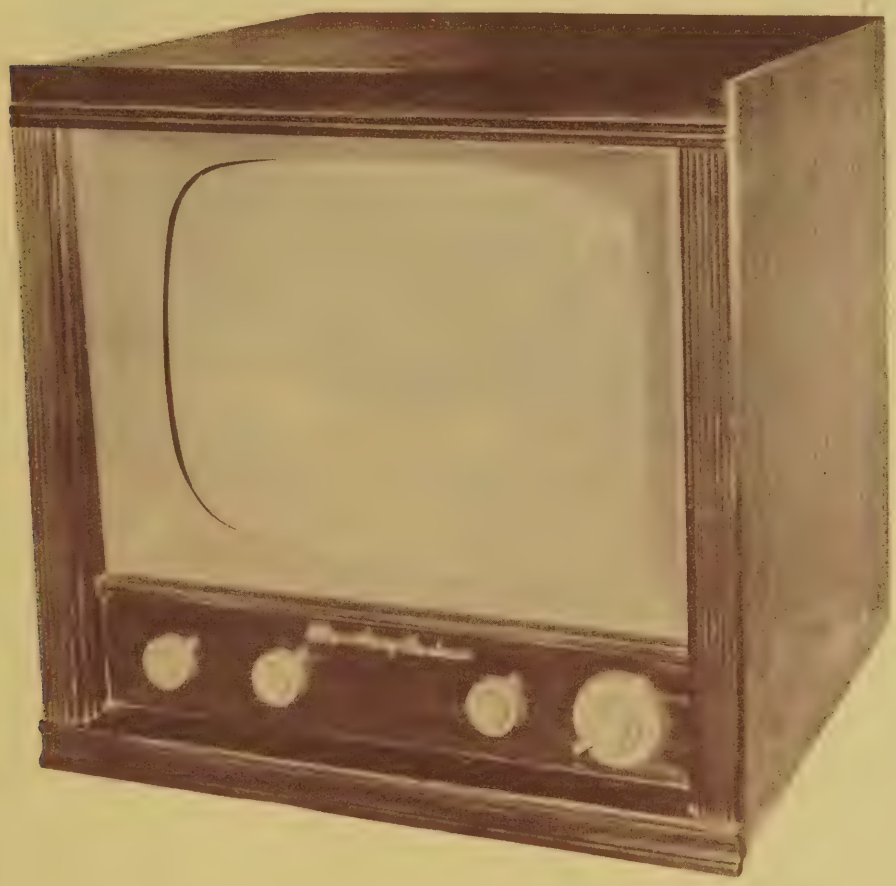

MODEL 417TX

STROMBERG-CARLSON MODELS 417C5-M, 417C5-O, 417C5-Dec, 417TX (Series 417)

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STROMBERG-CARLSON MODELS 417C5-M, 417C5-O, 417C5-Dec, 417TX (Series 417)

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3924 M...
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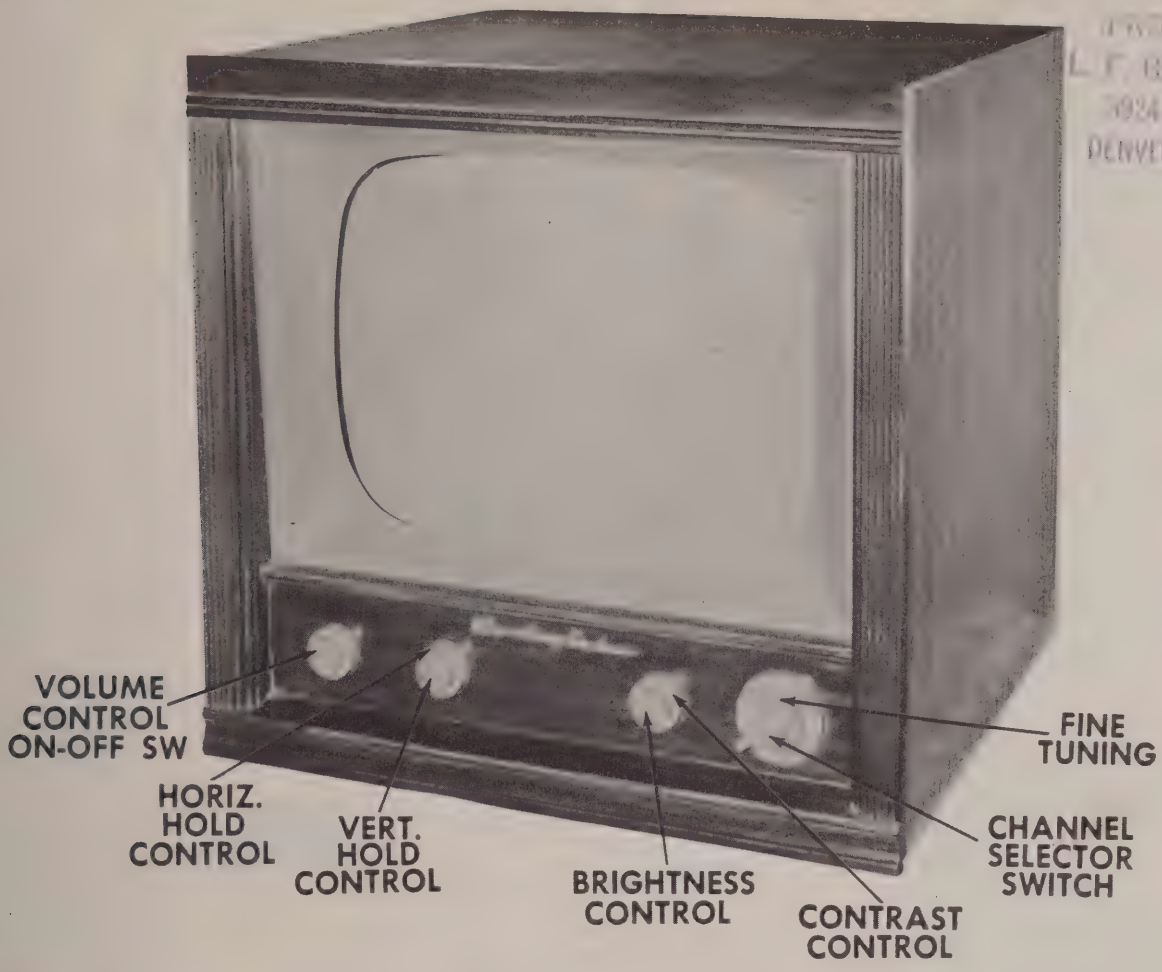

STROMBERG-CARLSON MODELS 417C5-M, 417C5-O, 417C5-Dec, 417TX (Series 417)

STROMBERG-CARLSON 417TX

TRADE NAME	Stromberg-Carlson models 417C5-Dec, 417C5-M, 417C5-0, 417TX
MANUFACTURER	Stromberg-Carlson Co., 100 Carlson Rd. Rochester 3, New York.
TYPE SET	Television Receiver
TUBES	Twenty-three
POWER SUPPLY	110-120 Volts AC-60 cycle
RATING	2.18 Amp. @ 117 Volts AC
TUNING RANGE—	Channels 2 thru 13

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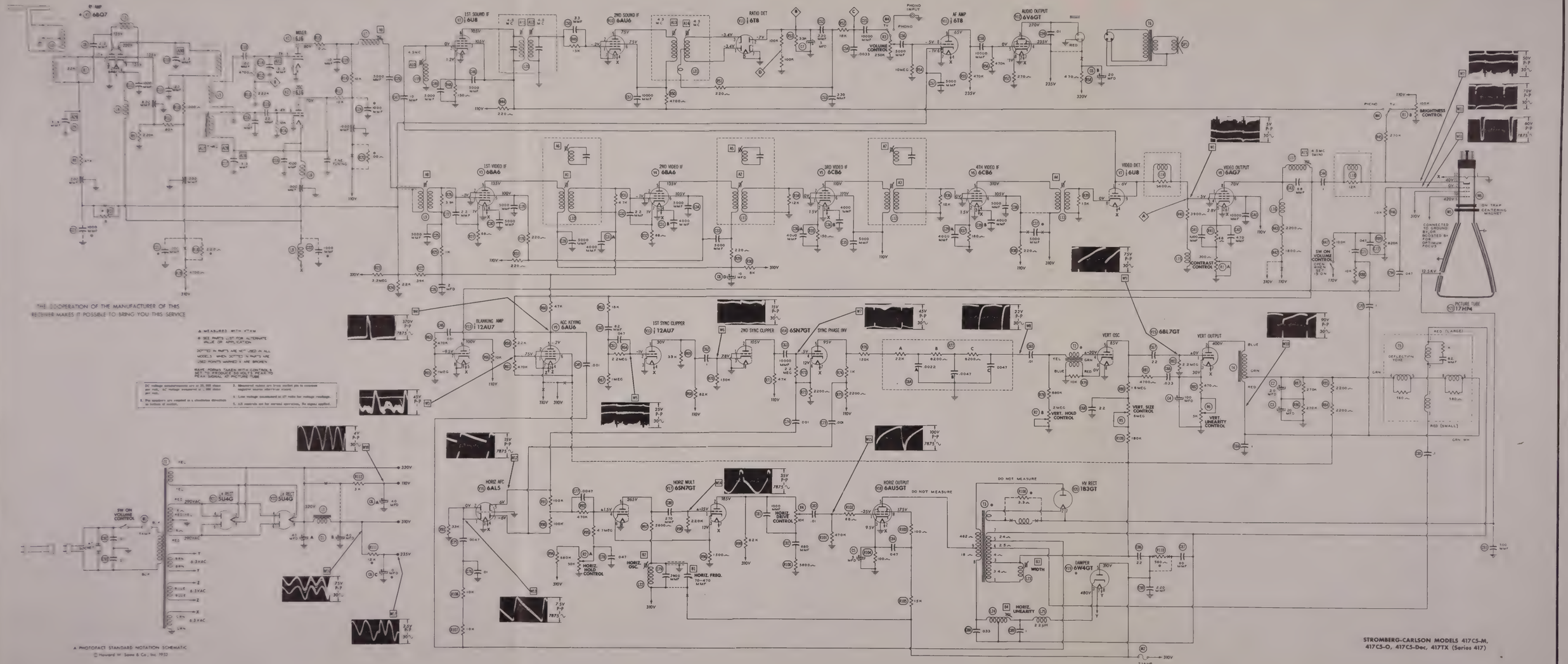
R AMP
6BQ7
MIXER
6J6
1ST SOUND IF
6U8
2ND SOUND IF
6AU6
RATIO DET
6T8
PHONO INPUT
VOLUME CONTROL
AF AMP
6T8
AUDIO OUTPUT
6V6GT
1ST VIDEO IF
6BA6
2ND VIDEO IF
6BA6
3RD VIDEO IF
6CB6
4TH VIDEO IF
6CB6
VIDEO DET
6U8
VIDEO OUTPUT
6AG7
BRIGHTNESS CONTROL
CONTRAST CONTROL
SW ON VOLUME CONTROL
4.5MC (MIN)
ION TRAP CENTERING MAGNET
CONNECTED TO GROUND BY LUG ADJUSTED B+ FOR OPTIMUM FOCUS
PICTURE TUBE
17HP4
BLANKING AMP
12AU7
AGC KEYING
6AU6
1ST SYNC CLIPPER
12AU7
2ND SYNC CLIPPER
6SN7GT
SYNC PHASE INV
VERT OSC
6BL7GT
VERT OUTPUT
VERT. SIZE CONTROL
VERT. HOLD CONTROL
VERT. LINEARITY CONTROL
DEFLECTION YOKE
RED (LARGE)
RED (SMALL)
GRN WH
HORIZ AFC
6AL5
HORIZ MULT
6SN7GT
HORIZ OUTPUT
6AU5GT
DO NOT MEASURE
HV RECT
1B3GT
HORIZ. HOLD CONTROL
HORIZ. OSC.
HORIZ. FREQ.
10-670 MMF
HORIZ. DRIVE CONTROL
WIDTH
HORIZ. LINEARITY
DAMPER
6W4GT
SW ON VOLUME CONTROL
1 RECT
5U4G
2 RECT
5U4G
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE
A MEASURED WITH VTVM
B SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DOTTED IN PARTS ARE NOT USED IN ALL MODELS WHEN DOTTED IN PARTS ARE USED POINTS MARKED X ARE BROKEN
WAVE FORMS TAKEN WITH CONTROLS SET TO PRODUCE SATURATED PEAK TO PEAK SIGNAL AT PICTURE TUBE
DC voltage measurements are at 20,000 ohms per volt. DC voltage measured to B- 300 ohms per volt.
1. Pin numbers are counted in a clockwise direction as bottom of socket.
2. Measured values are from socket pin to common negative source unless otherwise noted.
3. Line voltage maintained at 117 volts for voltage readings.
4. All controls set for normal operation. No signal applied.
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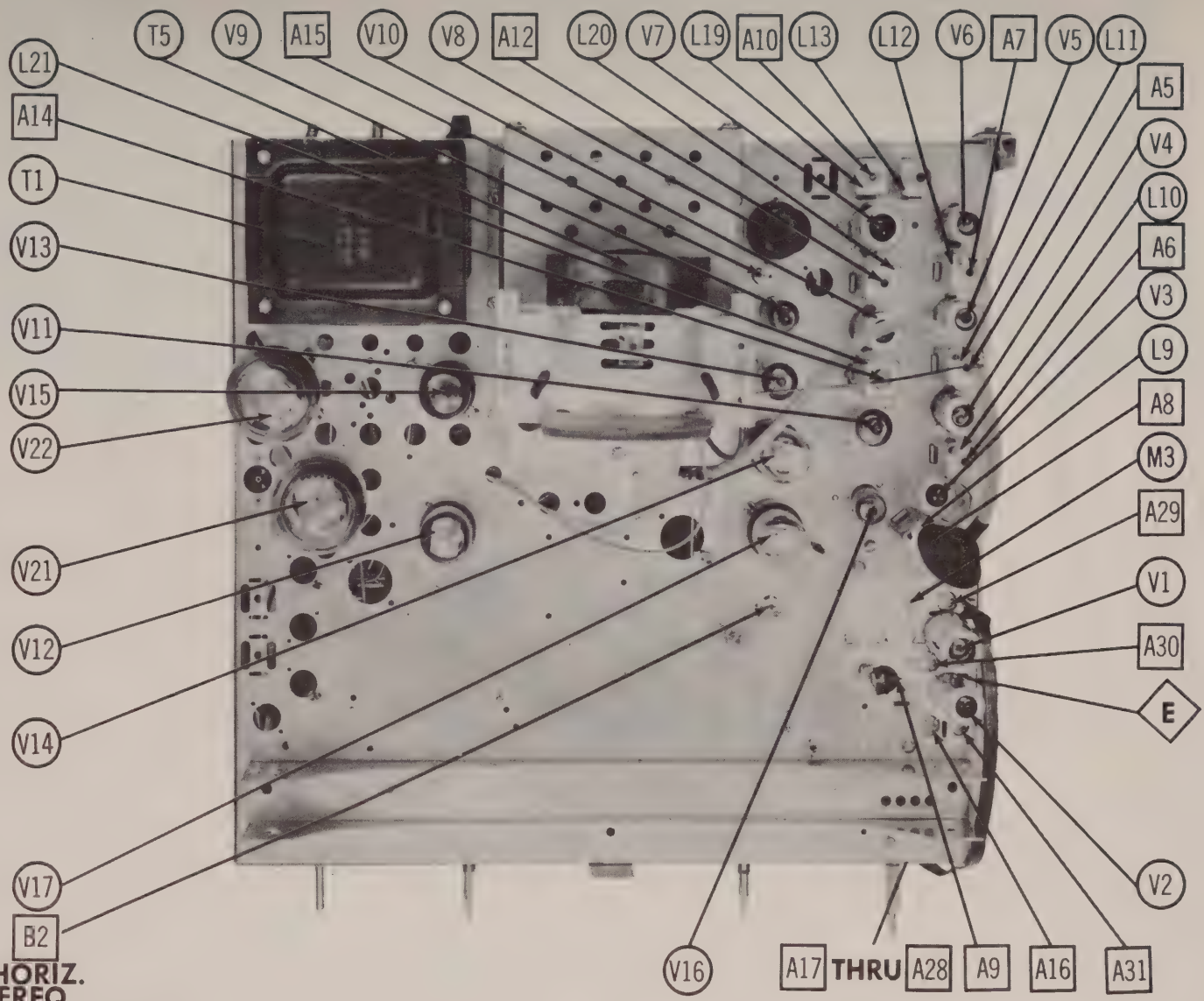
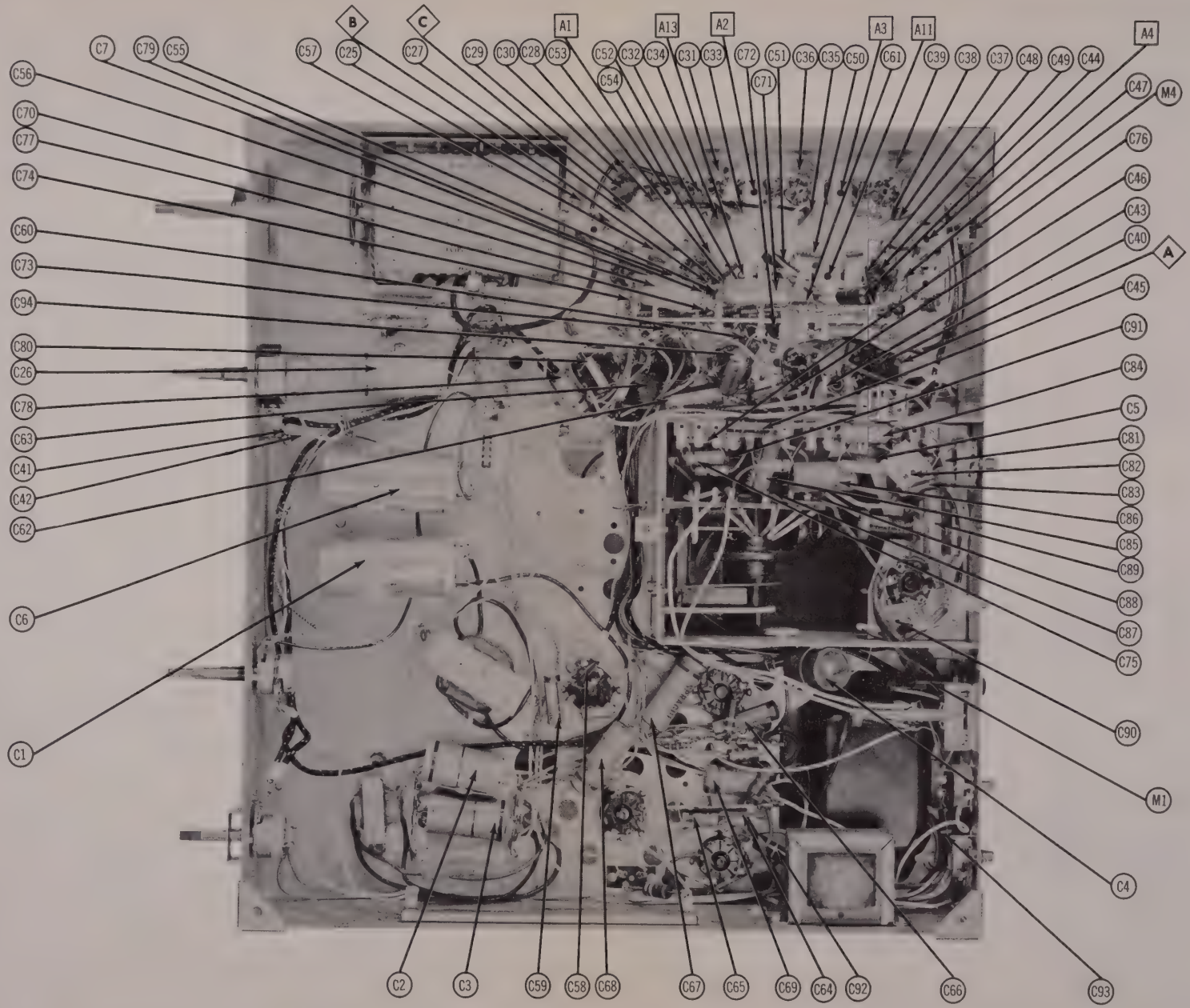
STROMBERG-CARLSON MODELS 417CS-M, 417CS-O, 417CS-Dec, 417TX (Series 417)

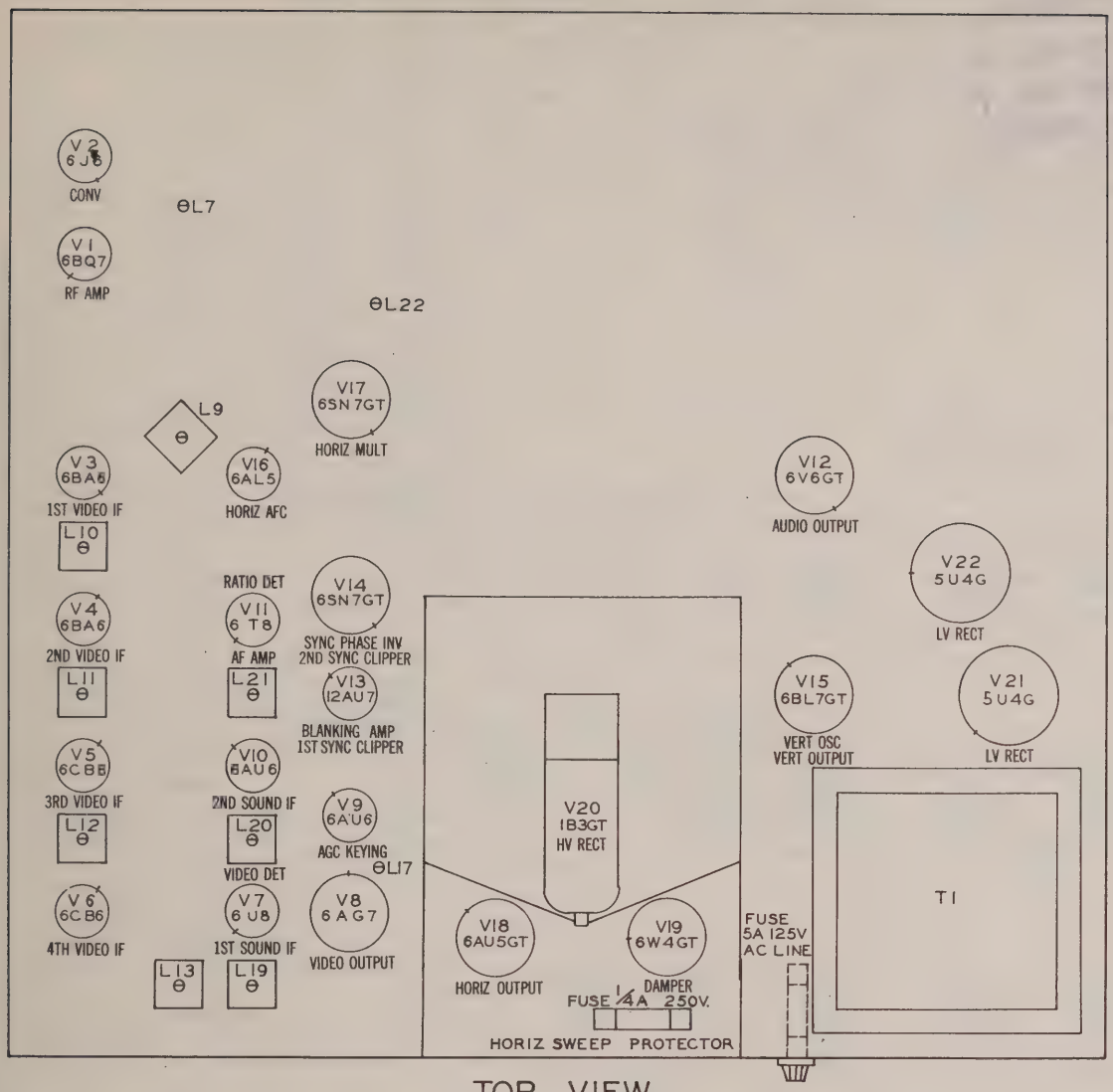


CHASSIS TOP VIEW



CHASSIS BOTTOM VIEW - CAPACITOR AND ALIGNMENT IDENTIFICATION

TUBE PLACEMENT CHART



TOP VIEW

TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube place ment chart for location and type of tube.

POWER SUPPLY FAILURE
No Raster, No Sound - V21, V22, Fuse (M1)

LOSS OF PICTURE OR SOUND
No Pic, No Sound, Has Raster - V2, V3, V4, V5, V6, V7
No Pic, No Sound, Has Snow - V1, V2, V3
No Pic, Has Sound, Has Raster - V8, V23
Has Pic, No Sound - V7, V10, V11, V12
Overloaded Picture - V9

SYNC FAILURE
No Vert. Sync. - V14, V15
No Horiz. Sync - V14, V16, V17
No Vert. or Horiz. Sync - V13, V14

SWEEP FAILURE
No Raster, Has Sound - V17, V18, V19, V20, V23, Fuse (M2)
No Vertical Deflection - V15
Poor Vert. Linearity or Foldover - V15
Poor Horiz. Linearity or Foldover - V17, V18, V19
Narrow Picture - V18, V17, V19, V21, V22
Vert. Off Freq. - V14, V15
Horiz. Off Freq. - V14, V16, V17

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

The high voltage shock hazard can be eliminated by removing the horizontal multivibrator tube, V17.

VIDEO IF ALIGNMENT

Remove the converter tube, V2, and replace it with a 6J6 which has pin 1 removed. This will disable the local oscillator and reduce the possibility of erroneous indications.
Connect the negative lead of a 3 volt battery to the ungrounded side of C26. Connect the positive lead to chassis.
During Video IF Alignment attenuate the sweep generator output to maintain 2 volts peak to peak response on the oscilloscope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	100MMF	High side to pin 1, (grid) of 6BA6 (V3). Low side to chassis.	24MC (10 MC Swp)	21.9MC 22.7MC 26.4MC 27.9MC	Any	Vert amp. thru 47KΩ to point A. Low side to chassis.	A1, A2, A3 A4	Adjust for response curve as shown in fig. 1 A1 affects the response at approximately 23.7MC, A2 is effective at 23.MC, A3 at 26MC and A4 at 25.3MC.
2.	"	"	"	21.9MC	"	"	A5, A6	Adjust A5 for MINIMUM marker indication at 21.9MC. point on curve. Adjust A6 for response as shown in fig. 2.
3.	"	"	"	27.9MC	"	"	A7	Adjust for MINIMUM marker response at 27.9MC. If necessay repeat step 1 for response of fig. 1.
4.	Direct	High side to an ungrounded tube shield floating over dummy converter tube (V2). Low side of chassis.	"	22.7MC 26.4MC	"	"	A8, A9	Adjust for curve of maximum gain and response as shown in fig. 3, with markers at 50%

SOUND IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

Connect two matched 100KΩ (±10%) resistors in series from point B to chassis. The junction of these two resistors is alignment point D as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
5.	100MMF	High side to pin 2 (grid) of 6U8 (V7). Low side of chassis.	4.5MC (Unmod)	Any	DC probe to point B Common to chassis.	A10, A11, A12, A13	Adjust for maximum deflection.
6.	"	"	"	"	DC probe to point C Common to point D	A14	Adjust for zero reading. A positive and negative reading will be obtained on either side of correct setting.

SOUND IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60% modulation and 450KC sweep. Use 120% sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	100MMF	High side to pin 2 (grid) of 6U8 (V7). Low side to chassis.	4.5MC (450KC Swp)	4.5MC	Any	Vert. amp. to point B. Low side to chassis.	A10, A11 A12, A13	Disconnect stabilizer capacitor C7. Adjust for curve of maximum amplitude and symmetry as per fig. 4.
6.	"	"	"	"	"	Vert. amp. to point C. Low side to chassis.	A14	Reconnect capacitor C7. Adjust so that 4.5MC occurs at center of crossover lines as per fig. 5. SLIGHTLY retouch A13 for maximum amplitude and straightness of crossover lines.

4.5MC TRAP ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
7.	100MMF	High side to pin 4 (grid) of 6AG7 (V8) Low side to chassis.	4.5MC (Unmod)	Any	DC probe thru crystal detector probe (fig 6) to pin 11 of picture tube.	A15	Adjust for MINIMUM deflection.

OSCILLATOR ALIGNMENT

Remove the dummy converter tube and replace the original 6J6 in its socket.
Complete oscillator alignment may not be necessary.
If the oscillator seems to be off frequency approximately the same amount for a majority of the channels it may be possible to correct them in one step using A16. It should be noted that this is an all channel oscillator circuit adjustment and should not be used to correct any individual channel. If adjustment of A16 will not bring all channels well within the range of the fine tuning control it will be necessary to adjust the channel strip adjustment for each channel that is off frequency. The channel adjustment screws are reached through a hole just to the right of the channel switch shaft. The correct adjustment screw is accessible through this hole as the channel switch is turned to each channel.
Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning control to the mid-position of its range.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
8.	Two 120Ω Carbon Resistors	Across antenna terminal with 120Ω in each lead.	213MC (10MC Swp)	211.25MC 215.75MC	13	Vert. amp. thru 47KΩ to point A. Low side to chassis.	A17	Adjust to place sound marker in notch as per fig. 7. Video marker should be at 50% of response.
			207MC (10MC Swp)	205.25MC 209.75MC	12		A18	
			201MC (10MC Swp)	199.25MC 203.75MC	11		A19	
			195MC (10MC Swp)	193.25MC 197.75MC	10		A20	
			189MC (10MC Swp)	187.25MC 191.75MC	9		A21	
			183MC (10MC Swp)	181.25MC 185.75MC	8		A22	
			177MC (10MC Swp)	175.25MC 179.75MC	7		A23	
			85MC (10MC Swp)	83.25MC 87.75MC	6		A24	
			79MC (10MC Swp)	77.25MC 81.75MC	5		A25	
			69MC (10MC Swp)	67.25MC 71.75MC	4		A26	
			63MC (10MC Swp)	61.25MC 65.75MC	3		A27	
			57MC (10MC Swp)	55.25MC 59.75MC	2		A28	

ALIGNMENT INSTRUCTIONS (CONT.)

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RF AND MIXER ALIGNMENT

Connect the synchronized sweep voltage from the signal generator to the horizontal input of the oscilloscope for horizontal deflection. The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
9.	120Ω Carbon resistors	Across antenna terminals with 120Ω in each lea lead.	207MC (10MC Swp)	205.25MC 209.75MC	12	Vert amp. thru 47KΩ to point E. Low side to chassis.	A29, A30, A31	Adjust for response curve similar to fig. 8 with markers above 90%.
10.	"	"	213MC (10MC Swp)	211.25MC 215.75MC	13			Check for response similar to fig. 8. If markers fall below 70 % on any channel. make slight adjustments of A29, A30 and A31 with channel switch set to that channel. Recheck all other channels to see that they have not been seriously affected.
			201MC (10MC Swp)	199.25MC 203.75MC	11			
			195MC (10MC Swp)	193.25MC 197.75MC	10			
			189MC (10MC Swp)	187.25MC 191.75MC	9			
			183MC (10MC Swp)	181.25MC 185.75MC	8			
			177MC (10MC Swp)	175.25MC 179.75MC	7			
			85MC (10MC Swp)	83.25MC 87.75MC	6			
			79MC (10MC S wp)	77.25MC 81.75MC	5			
			69MC (10MC Swp)	67.25MC 71.75MC	4			
			63MC (10MC Swp)	61.25MC 65.75MC	3			
			57MC (10MC Swp)	55.25MC 59.75MC	2			

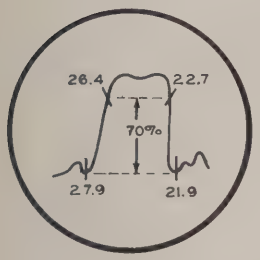


FIG.1

FIG.2

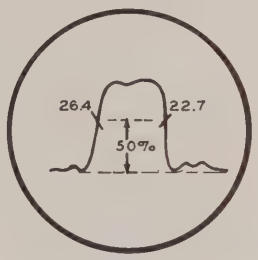


FIG.3

FIG.4

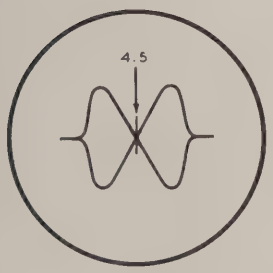


FIG.5

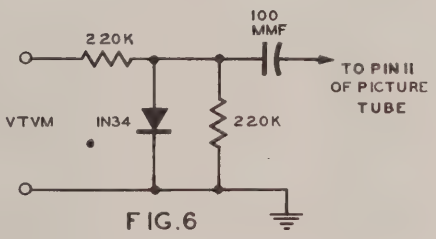


FIG.6

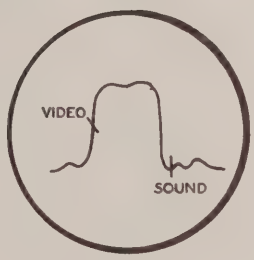


FIG.7

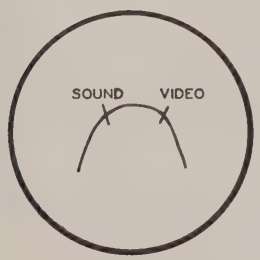
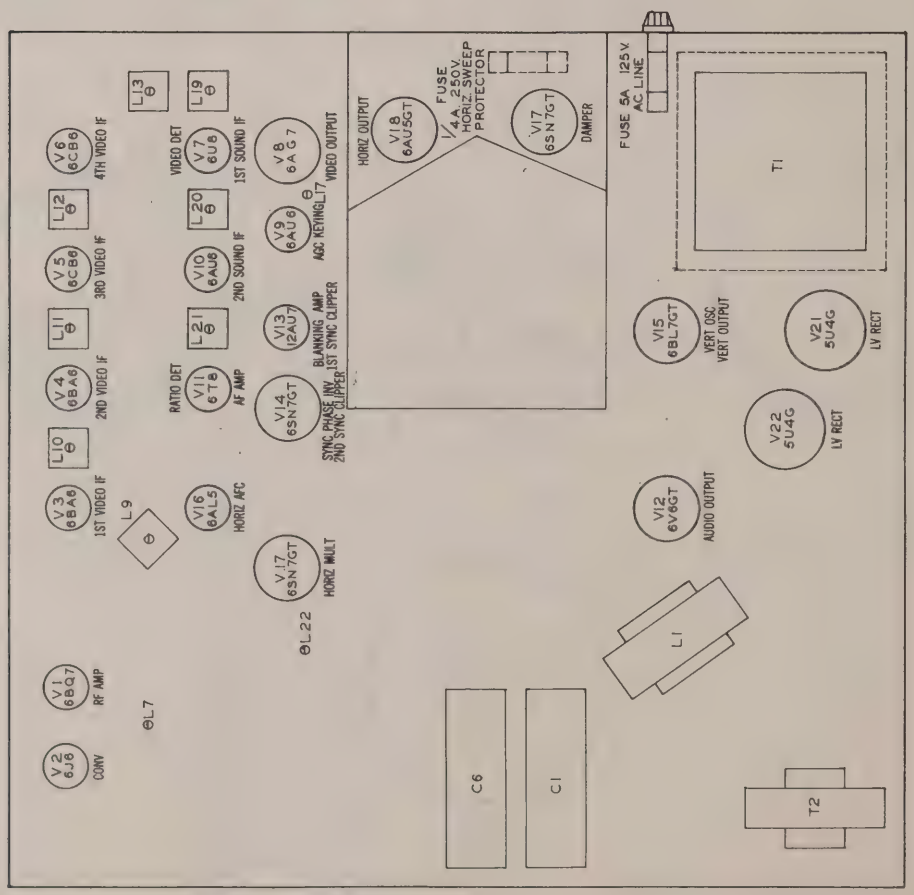


FIG.8

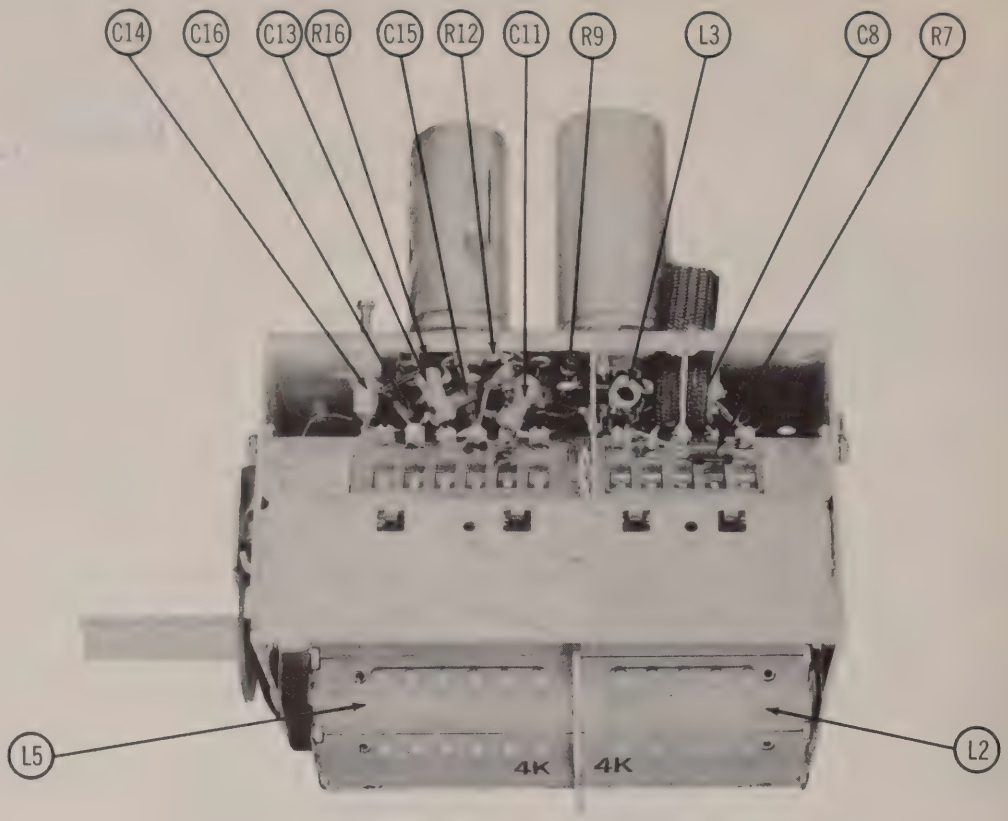
RESISTANCE MEASUREMENTS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BQ7	INF	70KΩ	0Ω	.1Ω	0Ω	†5.8KΩ	†100KΩ	INF	0Ω
V 2	6J6	†13KΩ	†13KΩ	.1Ω	0Ω	220KΩ	10KΩ	0Ω		
V 3	6BA6	61KΩ	0Ω	0Ω	.1Ω	†8.1KΩ	†3.4KΩ	68Ω		
V 4	6BA6	61KΩ	0Ω	0Ω	.1Ω	†8.3KΩ	†3.2KΩ	68Ω		
V 5	6CB6	.4Ω	150Ω	0Ω	.1Ω	†3KΩ	†3KΩ	0Ω		
V 6	6CB6	.3Ω	180Ω	0Ω	.1Ω	†87Ω	†3.2KΩ	0Ω		
V 7	6U8	3.9KΩ	3.2Ω	†3.2KΩ	.1Ω	0Ω	†3.2KΩ	150Ω	1Ω	3.9KΩ
V 8	6AG7	0Ω	0Ω	0Ω	3.9KΩ	210Ω	†3KΩ	.1Ω	†7KΩ	
V 9	6AU6	†28KΩ	†3KΩ	■0Ω	■.3Ω	110KΩ	†87Ω	†3KΩ		
V 10	6AU6	15KΩ	0Ω	0Ω	.1Ω	†7.9KΩ	†7.9KΩ	0Ω		
V 11	6T8	INF	33KΩ	INF	.1Ω	0Ω	22KΩ	0Ω	10Meg	†480KΩ
V 12	6V6GT	0Ω	0Ω	†1.1KΩ	†12KΩ	470KΩ	†480KΩ	.1Ω	270Ω	
V 13	12AU7	33KΩ	3.2Meg	0Ω	.1Ω	.1Ω	†13KΩ	1Meg	0Ω	0Ω
V 14	6SN7GT	0Ω	†50KΩ	150KΩ	2.2Meg	†6.2KΩ	2.2KΩ	.1Ω	0Ω	
V 15	6BL7GT	2.2Meg	#5.6KΩ	1.8KΩ	1.8Meg	#4Meg	170Ω	.1Ω	0Ω	
V 16	6AL5	33KΩ	33KΩ	0Ω	.1Ω	5.3Meg	0Ω	5.3Meg		
V 17	6SN7GT	220KΩ	†82KΩ	1.5KΩ	4.7Meg	†5.8KΩ	1.5KΩ	.1Ω	0Ω	
V 18	6AU5GT	470KΩ	.1Ω	100Ω	INF	#24Ω	INF	0Ω	†15KΩ	
V 19	6W4GT	INF	INF	130KΩ	INF	†87Ω	†87Ω	#32Ω	#32Ω	
V 20	1B3GT	PINS 1 - 8 HAVE INF. RESISTANCE								TOP CAP #486Ω
V 21	5U4G	INF	30KΩ	INF	16Ω	INF	16Ω	INF	30KΩ	
V 22	5U4G	INF	30KΩ	INF	16Ω	INF	16Ω	INF	30KΩ	
V 23	17HP4	0Ω	820KΩ	PIN 6 #4.4KΩ	PIN 10 †87Ω	PIN 11 310KΩ	PIN 12 .1Ω			

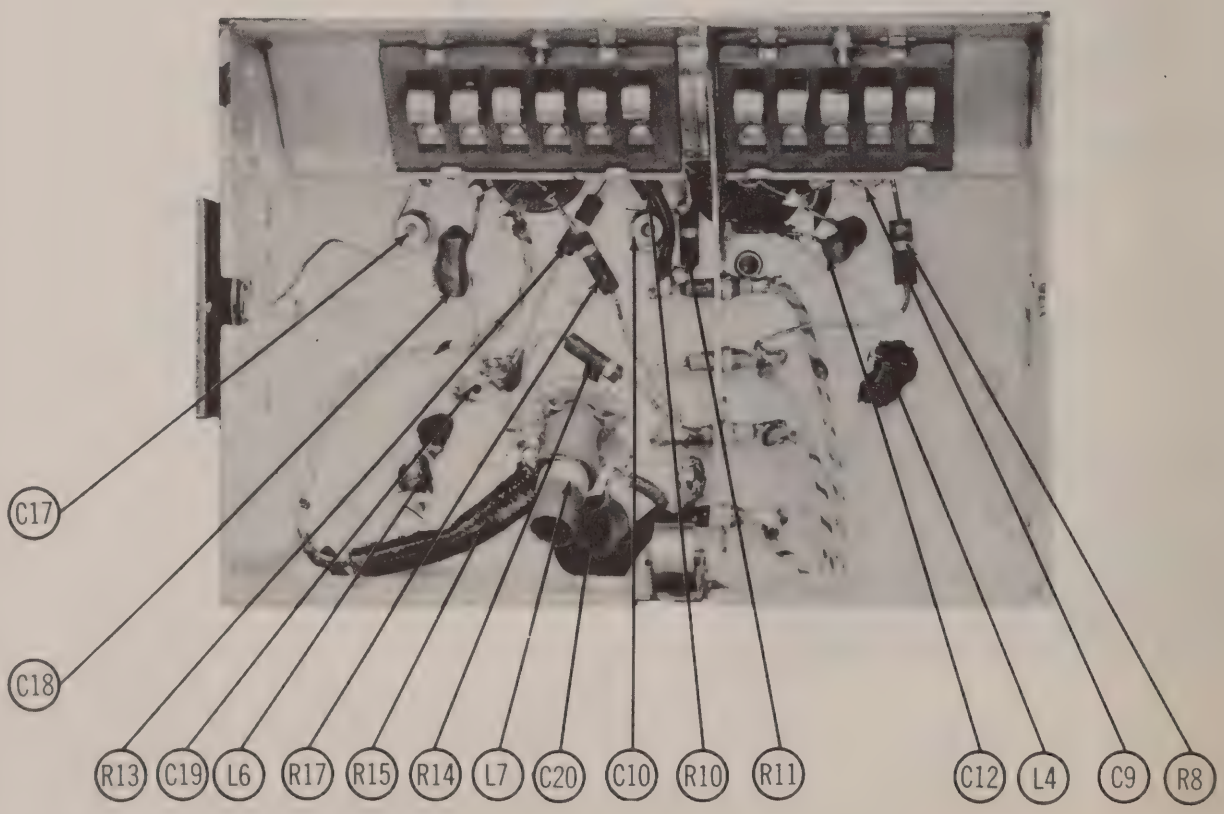
ALL CONTROLS SET FOR NORMAL OPERATION, NO SIGNAL APPLIED
† MEASURED FROM PIN 8 OF V21 & V22.
# MEASURED FROM PIN 3 OF V19.
■ MEASURED FROM 110VDC LINE



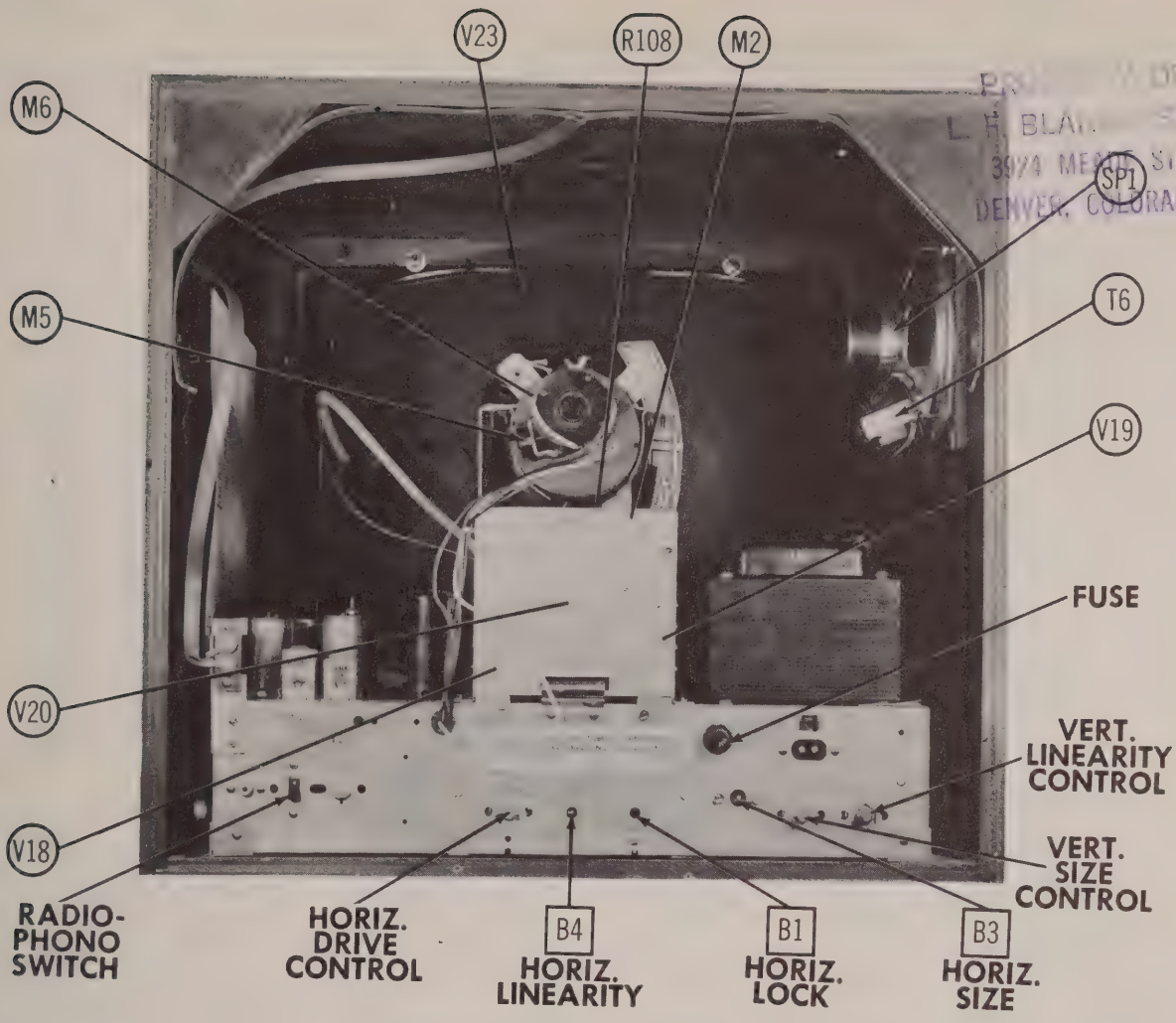
TUBE PLACEMENT CHART



RF TUNER-RIGHT SIDE



RF TUNER-BOTTOM VIEW



CABINET-REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably a test pattern.

Turn the horizontal hold control to the mid-position of its range and adjust the horizontal frequency trimmer (B1) until the picture synchronizes horizontally. If adjustment of B1 does not have sufficient range, set B1 one turn counter clockwise from fully clockwise and adjust the horizontal oscillator slug (B2) until the picture synchronizes horizontally.

The horizontal drive control should be set for the best compromise between brightness and horizontal linearity.

Adjust the horizontal size slug (B3) for a picture slightly wider than enough to fill the picture mask horizontally.

Adjust the horizontal linearity slug (B4) for a picture that is symmetrical from left to right.

DISASSEMBLY INSTRUCTIONS

1. Remove 6 push on type and 1 set screw type control knobs from front panel.
2. Disconnect built-in antenna & transmission lead from rear cover.
3. Remove 9 wood screws. Remove rear cover.
4. Disconnect speaker.
5. Remove 4 speaker nuts. Remove speaker .
6. Remove 5 chassis bolts. Remove chassis.

NOTE : FOR PICTURE TUBE REMOVAL IT IS NECESSARY TO REMOVE CHASSIS AS OUTLINED ABOVE.

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: Stromberg-Carlson PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1A	RF Amplifier	162102	6BQ7	9AJ	
B	RF Amplifier	162060	6BK7	9AJ	
V2	Converter	162018	6J6	7BF	
V3	1st. Video IF Amp.	162016	6BA6	7BK	
V4	2nd. Video IF Amp.	162012	6BA6	7BK	
V5	3rd. Video IF Amp.	162092	6CB6	7CM	
V6	4th. Video IF Amp.	162092	6CB6	7CM	
V7	Video Detector				
	1st. Sound IF Amp.-	162171	6U8	9-AE	
V8	Video Output	162023	6AG7	8Y	
V9	AGC Keying	162232	6AU6	7BK	
V10	2nd Sound IF Amp.	162032	6AU6	7BK	
V11	Ratio Detector - AF Amplifier	162077	6T8	9E	
V12	Audio Output	162118	6V6GT	7AC	
V13	Blanking Amp.- 1st. Sync. Clipper	162142	12AU7	9A	
V14	Sync. Phase Inv. - 2nd. Sync. Clipper	162114	6SN6GT	8BD	
V15	Vert Oscillator - Vert Output	162102	6BL7GT	8BD	
V16	Horiz. AFC	162022	6AL5	6BT	
V17	Horiz. Mult.	162018	6SN7GT	8BD	
V18	Horiz. Output	162067	6AU5GT	6CK	
V18A	Damper	162079	6W4GT	4CG	
B	Damper		6AX4	4CG	
V20	HV Rectifier	162029	1B3GT	3C	
V21	LV Rectifier	162107	5U4G	5T	
V22	LV Rectifier	162107	5U4G	5T	

CATHODE-RAY TUBE

ITEM No.	REPLACEMENT DATA: Stromberg-Carlson PART No.	REPLACEMENT DATA: SYLVANIA PART No.	RTMA BASE TYPE	NOTES
V23	162170 (17HP4)			

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	▲40	450	111095	AFH2-72		UPT4445		FP238	TVL-2764	
B	▲40	450								
C2	20	300	111085	PRS450/20		BR2035A		TC65	TVA-1608	
C3	20	300	111085	PRS450/20		BR2035A		TC65	TVA-1608	
C4	100	50	111097	PRS50/100		BRH501		TC3501	TVA-1310	
C5	5	50	111093	PRS150/4		BR550		TC30	TVA-1303	
C6A	▲40	450	111094	AFH4-124		UPT42U45		FP476	TVL-4840	
B	▲20	450								
C	10	450								Note 1
D	▲10	450								
C7	5	50	111047	PRS150/4		BR550		TC30	TVA-1303	
C8	2.2		110439		TCZ-2.2		NP0K-2R2		STCCB-V22	
C9	3-9		171213		829-10					
C10	.5-3		171212		829-3			CT565A		
C11	120		171216	S1120	D6-121	TM5T12	GP2K-121	UC-5312	5GA-T12	
C12	1000		110599	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C13	100		110401	S1100	D6-101	TM5T1	GP1K-101	UC-531	5GA-T1	
C14	.5-3		171212		829-3			CT565A		
C15	20		171215	S120NP0	TCZ-20		NP0K-200	ZT-542	5TCC-Q2	
C16	10		171232	S110N750	TCZ-10		N750K-100	NT-541	5TCU-Q1	
C17	.5-3		171212		829-3			CT 565A		
C18	1000		110599	BPD-001	DD-102	TM5D1	801-001	DC-521	5HK-D1	
C19	10		171214	S110NP0	TCZ-10		NP0K-100	ZT-541	5TCC-Q1	
C20	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C21	1000		110050	S1000	D6-102	TM5D1	GP2L-102	UC-521	50IC-1000	Note 1
C22	1000		110050	S1000	D6-102	TM5D1	GP2L-102	UC-521	50IC-1000	Note 1
C23	1000		110050	S1000	D6-102	TM5D1	GP2L-102	UC-521	50IC-1000	Note 1
C24	1000		110050	S1000	D6-102	TM5D1	GP2L-102	UC-521	50IC-1000	Note 1
C25	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C26	3	50	110675	389ZGXY-2		MTM2W2		UB352		
C27	2.2		110439		TCZ-2.2		NP0K-2R2		STCCB-V22	
C28	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C29	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C30	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C31A	4000		110685	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C32	2.2		110439		TCZ-2.2		NP0K-2R2		STCCB-V22	
C33	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C34	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C35	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C36A	4000		110685	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C37	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	Note 1
C38	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	Note 1
C39A	4000		110685	BPD-2X004	D6-402	TM5DD4	822-004	DCD-524	5HK-2D4	
B	4000				D6-402					
C40	10000		110672	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C41	1000		110599	S1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C42	470		110464	S1470	D6-471	5W5T5	GP2K-471	UC-5347	5GA-T47	
C43	68			S168	D6-680	5R5Q7	GP1K-680	UC-5468	5GA-Q68	
C44	.1	200	110415	P288-1	DF-104	PT2P1		PT401	2TM-P1	
C45	.001	1000	110731	P1088-001		PTE16D1		PT621	MB-D1	
C46	.001	400	110712	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C47	20		110495	S120	D6-200	5W5Q1	GP1K-100	UC-541	5GA-Q1	
C48	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C49	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C50	33		110486	S133	D6-330		GP1K-33	UC-5433	5GA-Q33	
C51	10000		110672	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C52	330		110454	S1330	D6-331		GP2K-331	UC-5333	5GA-T33	
C53	330		110454	S1330	D6-331		GP2K-331	UC-5333	5GA-T33	
C54	.0033	400	110715	P688-0033	D6-332	PTE6D33	GP2-333-332	PT6233	6TM-D3	
C55	10000		110672	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	

CAPACITORS (CONT.)

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: Stromberg-Carlson PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C56	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C57	5000		110586	BPD-005	DD-502	TM5D5	811-005	DC-525	5HK-D5	
C58	10000		110672	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C59	.01	600	110737	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C60	82		110596	S182			GP1K-820			
C61	.047	400	110722	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C62	.1	400	110724	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C63	1000		110672	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C64A	.0022			P688-0022		PTE6D22	GP2-333-222	PT6222		
B	.0047		●128200	P688-0047	●PC-100	PTE6D47	GP2-333-472	PT6247	●101C1	
C	.0047			P688-0047		PTE6D47	GP2-333-472	PT6247		
C65	.01	400	110718	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C66	.033	600	110740	P668-033		PTE6S33		PT6133		
C67	.22	600	110745	684-25		PTE6P25		PT6025	6TM-P25	
C68	.22	600	110745	684-25		PTE6P25		PT6025	6TM-P25	
C69	.1	600	110743	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C70	.1	600	110743	P688-1	DF-104	PTE6P1		PT601	6TM-P1	
C71	.1	400	110724	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C72	.047	200	110660	P288-047	DF-503	PTE4S47		PT4147	2TM-S47	
C73	.001	400	110712	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C74	.001	400	110712	P688-001	D6-102	PTE6D1	GP2L-102	PT621	6TM-D1	
C75	.0047	600	110735	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C76	.01	1000	110737	P1088-01		PTE16S1		PT1611	MB-S1	
C77	.0047	400	110716	P688-0047	D6-472	PTE6D47	GP2-333-472	PT6247	6TM-D47	
C78	.047	400	110722	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C79	3900	500	110309	1464-004		1DR5D4		MCB463		
C80	270	500	110208	1469-0003		5R5T3		MCB241	MS-33	
C81	500	500	110210	1468-001	D6-102	1W5D1	GP2L-102	MC255	1FM-21	
C82	680	500	110279	1479-0007		2R5T7			MS-37	
C83	.01	600	110737	P688-01	D6-103	PTE6S1	GP2-333-103	PT611	6TM-S1	
C84	.047	400	110722	P488-047	DF-503	PTE4S47		PT4147	4TM-S47	
C85	.1	400	110724	P488-1	DF-104	PTE4P1		PT401	4TM-P1	
C86	.22	400	110726	P488-22		PTE4P22		PT4025	4TM-P22	
C87	80	3000	110814							
C88	.033	400	110721	P488-033				PT4133		
C89	.1	400	110724	P488-1		PTE4P1		PT401	4TM-P1	
C90	220	500	110207	1468-00025	D6-221	5W5T25	GP2K-221	MC240	1FM-325	
C91	500	20000	110680	HV20A	TV1-502	MM-A20TS	413-501	HV-20035	20DK-T5	
C92	.01	1000	110568	P1088-01		PTE16S1		PT1611	MB-S1	
C93	.01	1000	110568	P1088-01		PTE16S1		PT1611	MB-S1	
C94	.047	400	110722	P488-047	DF-503	PTE S47		PT4147	4TM-S47	

Note 1. Not used in all models.
● Items C64A, C64B, C64C, R77A, R77B, R77C are combined in one unit.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: Stromberg-Carlson PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	300Ω	2	145129	QJ-288*	RTV-314			Contrast wire wound-panel
B	100KΩ							Brightness-rear
R2A	50KΩ		145128	QJ-69**	RTV-75		UF54L	Horiz. Hold-Panel
B	2Meg.						UR26L	Vert. Hold-Rear
R3A	250KΩ		145142	QJ3-130	AG-64-Z	B-51-S	U-44	Volume
B	Shaft		Not Req.	Not Req.	FS-3	Not Req.	Not Req.	Attach to R3A
C	Switch		Not Req.	76-2	SWE-2	Not Req.	U8-27	Attach to R2A
R4A	10KΩ	1/2	145132	QJ1-116	AG-27-S	AB-14	SU-20	Horiz. Drive
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R4A
R5A	6Meg.	1/2	145100		AM-86-S	AB-89		Vert Size
B	Shaft		Not Req.		FKS-1/4	AK-1		Attach to R5A
R6A	5000Ω	1/2	155079	QJ1-114	FKS-1/4	AB-10	SU-14	Vert Linearity
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R6A

● Concentrikit equivalent -kit K-3, Base elements & shafts W11-102 & P3-111 (panel) B11-128 & R2-131 (Rear).
●● Concentrikit equivalent-kit K-2, Base elements & shafts B11-123 & P1-112 (panel) B11-139 & R2-131 (rear).

RESISTORS

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: Stromberg-Carlson PART No.	IRC PART No.	NOTES
R7	22KΩ	1	149109	BTS-22K	
R8	47KΩ	1	149111		
R9	220KΩ	1	149115	BTS-220K	
R10	1000Ω	1	149101	BTS-1000	
R11	180KΩ	1/2	28182	BTS-180K	5%
R12	4700Ω	1	28166	BTS-4700	10%
R13	220KΩ	1	149115	BTS-220K	
R14	10KΩ	1	149107	BTS-10K	10%
R15	10Ω	1	149089		10%
R16	10KΩ	1	28170	BTS-10K	10%
R17	10KΩ	1	28170	BTS-10K	10%
R18	220Ω	1	149097	BTS-220	10%
R19	4700Ω	2	149080	BTB-4700	
R20	100Ω	1	149095	BTS-100	10%
R21	1000Ω	1	149101	BTS-1000	10%
R22	39KΩ	1	28176	BTS-39K	10%
R23	3.3Meg.	1	149122	BTS-3.3Meg.	
R24	22KΩ	1	149109	BTS-22K	
R25	1000Ω	1	149101	BTS-1000	
R26	3900Ω	1	28165	BTS-3900	10%
R27	68Ω	1	28144		10%
R28	220Ω	1	149097	BTS-220	
R29	220Ω	1	149097	BTS-220	
R30	8000Ω	10	149331	1 3/4A-8000	10%
R31	4700Ω	1	28166	BTS-4700	10%
R32	68Ω	1	28144		10%
R33	220Ω	1	149097	BTS-220	
R34	12KΩ	1	28171		10%
R35	150Ω	1	149096	BTS-150	
R36	12KΩ	1	28171		10%
R37	180Ω	1	28149	BTS-180	10%
R38	220Ω	1	149097	BTS-220	10%
R39	15KΩ	1	28172		10%
R40	3900Ω	1	28165	BTS-3900	10%
R41	68Ω	1/2	28144		10%
R42	1800Ω	2	149047	BTB-1800	10%
R43	2200Ω	2	149048	BTB-2200	10%
R44	220Ω	1	149097	BTS-220	
R45	270KΩ	1	28184	BTS-270K	10%
R46	10KΩ	1	149107	BTS-10K	
R47	100KΩ	1	149113	BTS-100K	
R48	150Ω	1	149096	BTS-150	
R49	15KΩ	1	149108		
R50	4700Ω	1	149142	BTA-4700	
R51	220Ω	1	149097	BTS-220	
R52	18KΩ	1/2	28173	BTS-18K	
R53	33KΩ	1	149110	BTS-33K	
R54	10Meg.	1	149125	BTS-10Meg.	
R55	470KΩ	1	149117	BTS-470K	
R56	470KΩ	1/2	149117	BTS-470K	10%
R57	270Ω	1	149170	BTA-270	10%
R58	470Ω	2		BTB-470	
R59	22KΩ	1	149109	BTS-22K	
R60	47KΩ	1	149111	BTS-47K	
R61	470KΩ	1	149117	BTS-470K	
R62	18KΩ	1/2	28173	BTS-18K	
R63	470KΩ	1	149117	BTS-470K	
R64	2.2Meg.	1	149121	BTS-2.2Meg	
R65	1Meg.	1	149119	BTS-1 Meg.	
R66	10KΩ	1/2	149107	BTS-10K	10%
R67	1Meg.	1	149119	BTS-1 Meg.	
R68	82KΩ	1	28180	BTS-82K	10%
R69	33KΩ	1	149110	BTS-33K	
R70	150KΩ	1	149114	BTS-150K	
R71	47KΩ	1	149111	BTS-47K	
R72	2200Ω	10%	28182	BTS-2200	
R73	2.2Meg.	1	149121	BTS-2.2Meg	
R74	1000Ω	1/2	28158	BTS-1000	10%
R75	2200Ω	1/2	28162	BTS-2200	10%
R76	150KΩ	1	149114	BTS-150K	
R77A	22KΩ	1/2		BTS-22K	10%
B	8200Ω	1/2	●128200	BTS-8200	10%
C	8200Ω	1/2		BTS-8200	10%
R78	680KΩ	1	149118	BTS-680K	

RESISTORS (CONT.)

ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: Stromberg-Carlson PART No.	IRC PART No.	NOTES
R79	10KΩ	1	149107	BTS-10K	
R80	1.6Meg.	1/2	28184	BTS-1.6Meg	10%
R81	4700Ω	1/2	28166	BTS 4700	10%
R82	470Ω	1	149136	BTA-470	
R83	2.2Meg.	1	149121	BTS-2.2Meg	
R84	2200Ω	2	149048	BTB-2200	
R85	220Ω	2	149078	BTB-2200	
R86	270KΩ	1/2	28184	BTS-270K	10%
R87	270KΩ	1/2	28184	BTS-270K	10%
R88	10KΩ	1	147107	BTS-10K	
R89	820KΩ	1/2	28190	BTS-820K	10%
R90	100KΩ	1/2	149385	BTS-100K	10%
R91	100KΩ	1/2	149385	BTS-100K	10%
R92	470KΩ	1	149117	BTS-470K	10%
R93	33KΩ	1	149110	BTS-33K	
R94	680KΩ	1	149118	BTS-680K	
R95	4.7Meg	1	149123	BTS-4.7Meg	
R96	1500Ω	1/2	28160	BTS 1500	10%
R97	5600Ω	1/2	149184	BTA-5600	10%
R98	220KΩ	1	149115	BTS 220K	
R99	82KΩ	1/2	28180	BTS 82K	10%
R100	5600Ω	1/2	28167	BTS-5600	10%
R101	470KΩ	1	149117	BTS-470K	
R102	68Ω	1/2	28144		10%
R103	100Ω	1	149095		
R104	100Ω	2	149070	BW-2-100	
R105	15KΩ	2	149056	BTB-15K	10%
R106	10KΩ	1	149402	BTA-10K	10%
R107	10KΩ	1	149402	BTA-10K	10%
R108	3.3Ω	10	149419		10%
R109	180KΩ	1/2	28182	BTS-180K	10%
R110	560KΩ	1/2		BTS-560	10%
R111	12KΩ	2		BTB-12K	10%
R112	3000Ω	30	149377	ZD-3000	10%

All resistors ±20% unless otherwise noted.
● Items R77A, R77B, R77C, C64A, C64B, C64C are combined in one unit.
Note 1. Not used in all models.
Note 2. Some models use an RF Choke in this application.
Note 3. Some models use a 470Ω resistor in this application.

SPEAKER

ITEM No.	RATINGS: SIZE	RATINGS: FIELD	RATINGS: V. C. IMP.	REPLACEMENT DATA: Stromberg-Carlson PART No.	REPLACEMENT DATA: JENSEN PART No.	REPLACEMENT DATA: QUAM PART No.	NOTES
SP1	5½"	PM	2.9Ω	155207	ST-803 Mod. P-525V	52A1	

TRANSFORMER (POWER)

ITEM No.	RATING: PRI.	RATING: SEC. 1	RATING: SEC. 2	RATING: SEC. 3	REPLACEMENT DATA: Stromberg-Carlson PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
T1	117VAC ② 2.18A.	580VCT .275ADC	5VAC ④ 6A	6.3VAC ② .3A	161428				
			SEC. 4	SEC. 5					
			6.3VAC ④ 1.15A	6.3VAC ② 9.3A					

TRANSFORMER (SWEEP CIRCUITS)

ITEM No.	RATING: DC RESISTANCE PRI.	RATING: DC RESISTANCE SEC.	REPLACEMENT DATA: Stromberg-Carlson PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T2	170Ω	930Ω	161254	A-8125	A-3000 ②	TBO-2 ③	A-97X	Vert. Osc. Trans.
T3	480Ω	34Ω Tap	114858 ① 161043-1					Horiz. Output Trans.
	Tap ④	② 3.4Ω,	161043 ④					
	18Ω	7.4Ω, 9.9Ω						
T4	1200Ω		161255	A-8123	A-3037	TSO-8	A-102X	Vert. Output Trans.
	Tap ④ 12Ω							
T5A	18Ω		114706	DY-9	MDF-70	TY-3	Y-17	Horiz. Deflection Coils
B	46Ω							Vert. Deflection Coils

① Alternate Vert. Osc.
② Drill one new mtg. hole
③ Mount on top of chassis
④ Alternate Horiz. output trans.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: Stromberg-Carlson PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	[illegible] PART No.	NOTES
T6	6.2KΩ	2.9Ω	565Ω	.38Ω	161259	A-3823 ①	A-3020 ①	RO-13	S-7X	↓ Drill one new mtg. hole.

FILTER CHOKE

ITEM No.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000 ∿)	REPLACEMENT DATA: Stromberg-Carlson PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.
L1	.250A	87Ω	2.3 Hy.	161020 161030 ②	C-2326 ①	C-2996 ①	TR-3300 ①	C-18A ①

① Drill one new mtg. hole
② Alternate filter choke.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA: Stromberg-Carlson PART No.	MERIT PART No.	IRC PART No.	NOTES
L2	Ant. Coils	0Ω	0Ω				
L3	RF Choke	0Ω					
L4	Fil. Choke	0Ω					
L5	RF Mixer Grid & Osc.	0Ω					
L6	Fil. Choke	0Ω					
L7	Conv. Plate	.5Ω					
L8	Fil. Choke	.14Ω		114707		CL-1	.47 Microhenry
L9	IF Coupling	.3Ω	.4Ω	114119			
L10	1st. Video IF	.4Ω	.4Ω	114397			Includes Trap
L11	2nd. Video IF	.4Ω	.4Ω	114397			Includes Trap
L12	3rd. Video IF	.3Ω	.3Ω	114406			Includes Trap
L13	4th. Video IF	1Ω	1Ω	114407			
L14	Peak. Coil	5Ω		114637			Wound on 5.6KΩ resistor
L15	Peak. Coil	7.5Ω		114713			120 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (CONT.)

ITEM No.	USE	DC RES.		REPLACEMENT DATA			NOTES
		PRI.	SEC.	Stromberg-Carlson PART No.	MERIT PART No.	IRC PART No.	
L16	Peak. Coil	10.5Ω		114738			
L17	4.5MC Trap	1.8Ω		114383	TV-151		
L18	Peak. Coil	13Ω		114726	TV-188 *		Wound on 12KΩ resistor
L19	1st.Sound IF	3.2Ω		114400			
L20	2nd.Sound IF	2Ω	2Ω	114401	TV-113		
L21	Ratio Detect.	5Ω	.8Ω CT	114375			Tertiary Winding .6Ω
L22	Horiz. Osc.	100Ω		114069	TV-163		
L23	Horiz. Size	2.1Ω		114083	MWC-2		
L24	Horiz. Lin.	5.8Ω		114084			Tap @ 1.6Ω
L25	Cath. Choke	1.8Ω		114693		CLA	2.2 Microhenries
L26	Fil. Choke	3Ω				CLA	3.3 Microhenries

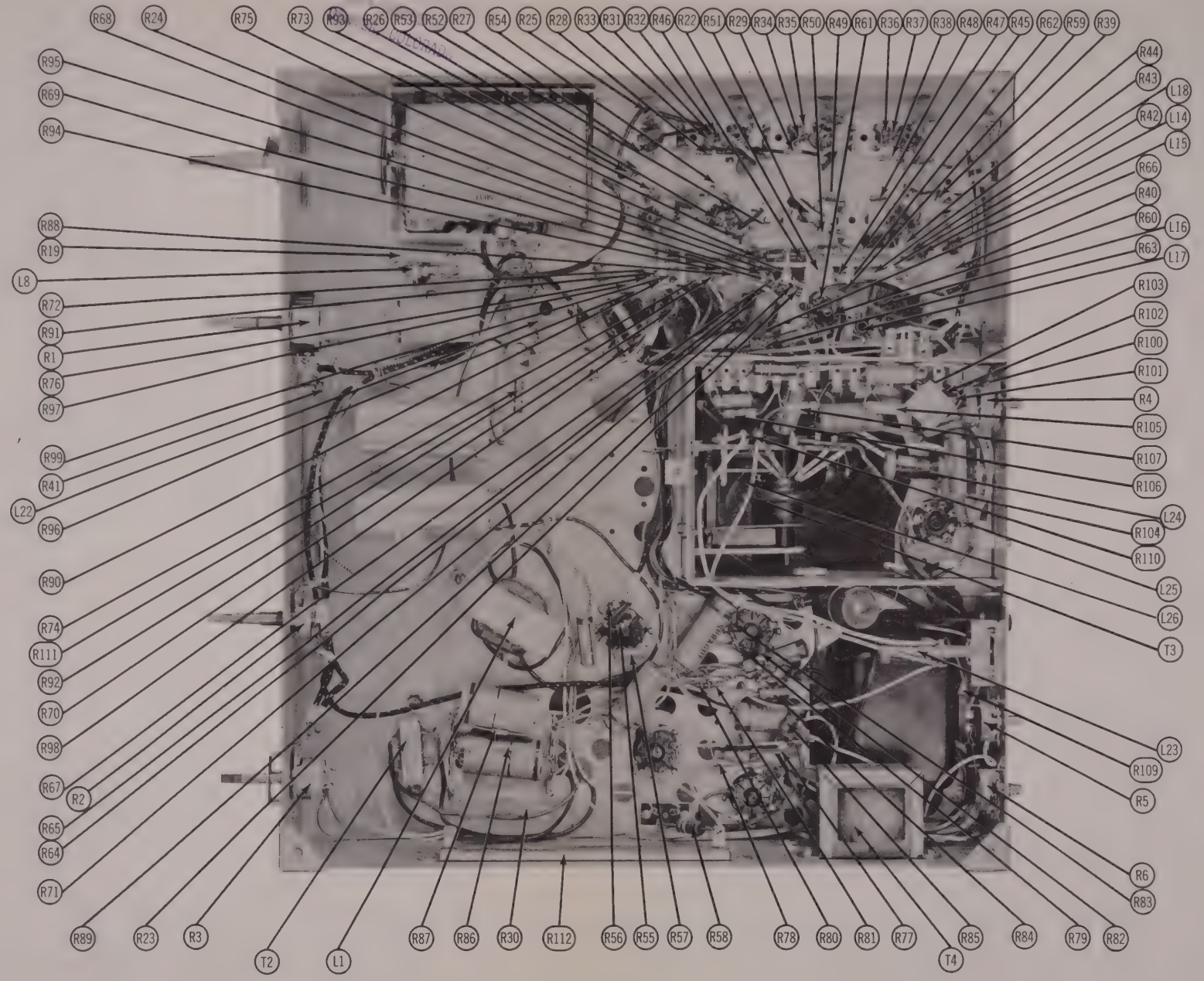
* Parallel with 12KΩ resistor

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Stromberg-Carlson PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	MDL	5A.	128007	128008	313005 (3AG-Slo-Blo)	342001	MDL5	HKP
M2	GJV	1/4A. 250V.	128000		318.250 (3AG-P/T)		GJV 1/4	

MISCELLANEOUS

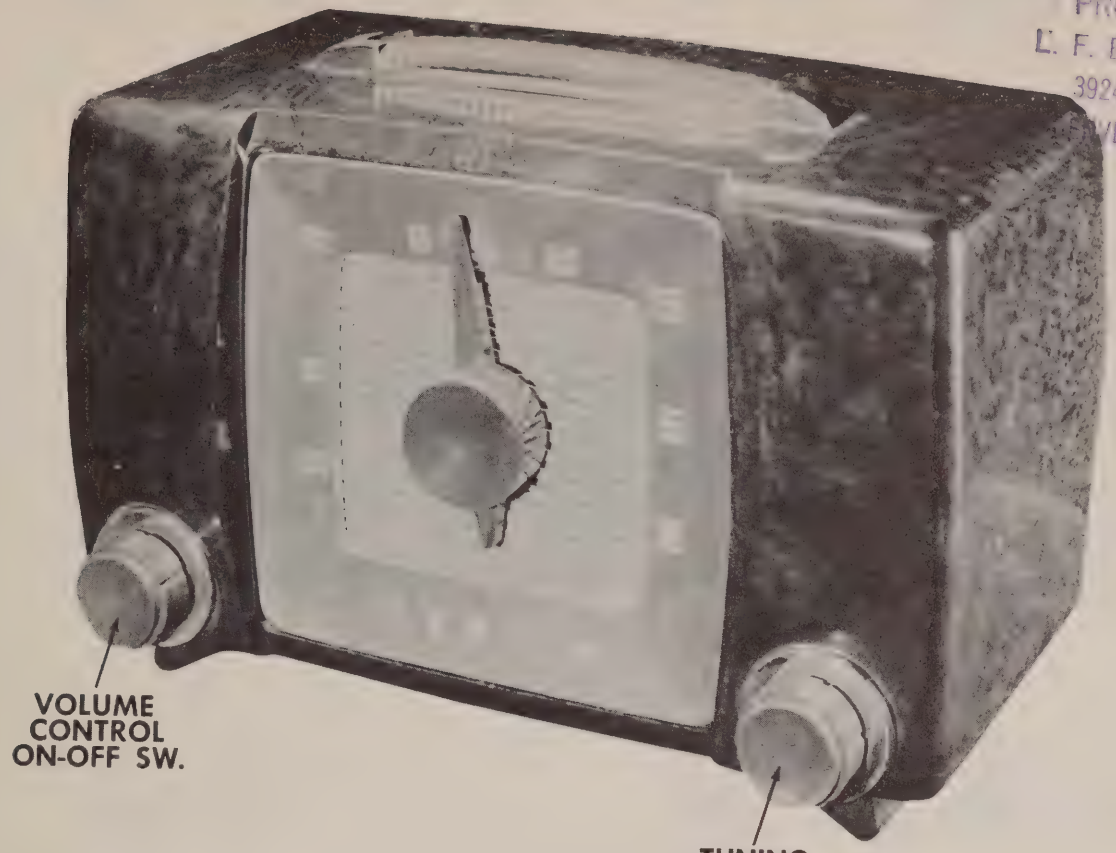
ITEM No.	PART NAME	Stromberg-Carlson PART No.	NOTES
M3	RF Tuner	164019	
M4	Switch	158037	TV-Phono
M5	Centering Magnet	114117	
M6	Ion Trap	114645	
B1	Trimmer	110043	Horiz. Freq. (70-470MMF)
	Knob	134164	Channel Selector
	Knob	134165	Fine Tuning
	Knob	134166	Horiz. Hold & Contrast
	Knob	134167	Vert. Hold & Brightness
	Knob	134177	On/off Volume
	Back Panel	101222	Model 417TX
	Back Panel	101220	Models 417C5-M, 417C5-0 & 417C5-Dec.
	Decal	121071	Model 417TX
	Decal	121066	Models 417C5-M, 417C5-0 & 417C5-Dec.
	Escutcheon	142187	TV Channel
	Gasket	133114	Lens
	Safety Glass	138034	
	Name Plate	121063	Model 417TX
	Name Plate	121065	Models 417C5-M, 417C5-0 & 417C5-Dec.
	Cabinet	108256	Model 417TX
	Cabinet	108227	Model 417C5-M
	Cabinet	108257	Model 417C5-0
	Cabinet	108258	Model 417C5-Dec.



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

PROPE
L. F. BLAN
3924 M
VER, C

ZENITH
MODEL H615Z1 (Ch. 6G05Z1)



ZENITH
MODEL H615Z1 (Ch. 6G05Z1)

TRADE NAME	Zenith Model H615Z1 (Ch. 6G05Z1)
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.
TYPE SET	AC/DC Operated AM Superheterodyne Receiver
TUBES (SIX)	Types 6BJ6 RF Amp., 12BE6 Comv., 6BJ6 IF Amp., 12AT6 Det.-AVC-AF Amp. 35L6GT Audio Output, 35W4 (or) 35Z5GT Rectifier
POWER SUPPLY	110-120 Volts AC
RATING	.240 Amp. @ 117 Volts AV
TUNING RANGE—BROADCAST	535-1620

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1MFD capacitor in series with low side of signal generator and B-. Loop should be maintained in same relative position to chassis as when receiver is in cabinet. Volume control should be at maximum oposition. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.5MFD	High side to pin 7 (grid) of 12BE6 (V2) Low side to B-.	455KC (400~Mod.)	600KC	Across voice coil.	A1, A2, A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001MFD to reduce hum modualtion.
2.		Loop	1600KC	1600KC	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6, A7	"

After alignment tune receiver to 1600KC signal, replace in cabinet and set pointer to 1600KC mark on dial.

"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed." "Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. Copyright 1952 by Howard W. Sams & Co., Inc., Indianapolis 5, Indiana, U. S. of America. Copyright under International Copyright Union. All rights reserved under Inter-American Copyright Union (1910) by Howard W. Sams & Co., Inc." Printed in U. S. of America

PARTS LIST AND DESCRIPTIONS

ZENITH
MODEL H615Z1 (Ch. 6G05Z1)

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	EIA BASE TYPE	NOTES
V1	RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12BE6	12BE6	7CH	
V3	IF Converter	6BJ6	6BJ6	7CM	
V4	Det.-AVC-AF	12AT6	12AT6	7BT	
V5	Audio Output	35L6GT	35L6GT	7AC	
V6A	Rectifier	35W4	35W4	5BQ	
B	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	22-1808	AFH3-10		UP8415		FP216	TVL-3440	
B	▲40	150								
C2	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C3	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C4	.05	200	22-178	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C5A			105-14							Note
B										Note
C										Note
C6	.01	400	22-1182	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C7	.05	400	22-1017	P488-05	DF-503	PTE4S5		PT415	4TM-S5	
C8	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	

Note Some models use seperate units in this application.
Some models combine C5A, C5B, C5C, R12, R13 in one usit. (Part No. 105-28)

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1 Meg.	½	63-1664	Q13-137	AG-63-Z	AB-69	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	AK-4	Not Req.	Attach to R1A
C	Switch		Not Req.	76-1	SWB	KB-1	US-26	Attach to R1A

RESISTORS

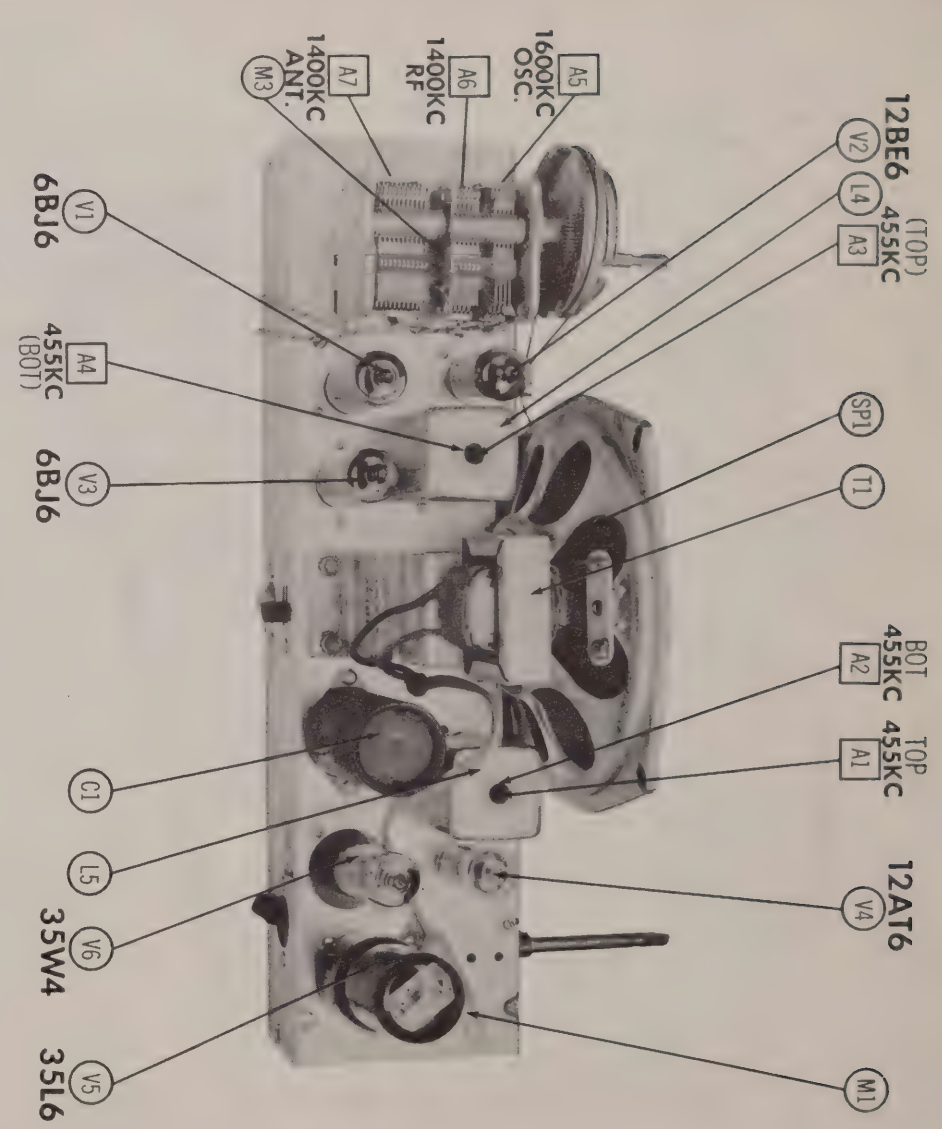
ITEM No.	RATING: OHMS	RATING: WATTS	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: IRC PART No.	NOTES
R2	330Ω	½	63-1765	BTS-330	
R3	10KΩ	½	63-1828	BTS-10K	
R4	1000Ω	½	63-1786		
R5	22KΩ	½	63-1842	BTS-22K	
R6	100Ω	½	63-1744	BTS-100	
R7	2.2Meg	½	63-1926	BTS-2.2 Meg	
R8	1 Meg.	½	63-1912	BTS-1Meg.	
R9	4700Ω	½	63-1814	BTS-4700	
R10	2200Ω	½	63-1800	BTS-2200	
R11	4.7Meg	½	63-1940	BTS-4.7 Meg.	
R12	470KΩ	½	63-1898	BTS-470K	Note 1
R13	470KΩ	½	63-1898	BTS-470K	Note 1
R14	150Ω	1	63-1977	BTA-150	
R15	1000Ω	1	63-1574	BTA-1000	
R16	22Ω	½	63-1219		
R17	*	*	63-2797		

Note 1. Some models combine R12, R13, C5A, C5B, C5C in one unit (part no. 105-28)
* Special temperature compensating resistor. 100Ω Hot, 600Ω Cold.

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: ZENITH PART No.	STANCOR PART No.	MERIT PART No.	CHICAGO PART No.	TRIAD PART No.	NOTES
T1	3.1KΩ	3.1Ω	260Ω	.6Ω	206-643 ①	A-3825 ①	A-3018 ①	R0-303 ①	S-4X ①	① Bend mtg. tabs down, file out slots, mount on original mtg. bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS			REPLACEMENT DATA			NOTES
	SIZE	FIELD	V. C. IMP.	ZENITH PART No.	JENSEN PART No.	QUAM PART No.	
SP1	5 1/4"	PM	3.1Ω	49-643	ST 803 Mod. P525-J	52A1	

COILS (RF-IF)

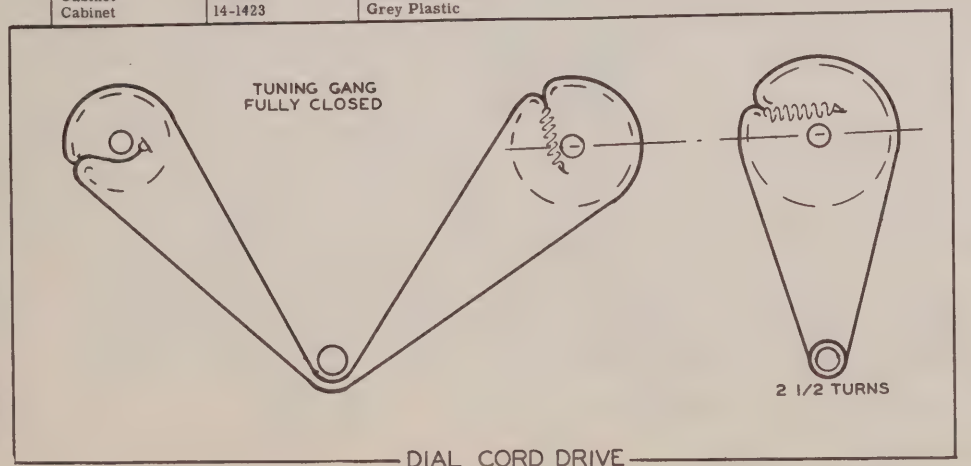
ITEM No.	USE	DC RES.		REPLACEMENT DATA		NOTES
		PRI.	SEC.	ZENITH PART No.	MERIT PART No.	
L1	Loop Ant.	3.8Ω		S16134		
L2	RF Coil	3Ω	11Ω	S14832		Tap @ 5.3Ω
L3	Osc. Coil	.6Ω	9Ω	S14833		
L4	Input IF	23Ω	23Ω	95-1101		
L5	Output IF	23Ω	23Ω	95-1102		

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		NOTES
					ZENITH PART No.		
M1	Bayonet	6-8	.15	Brown	100-67		Type No. 47

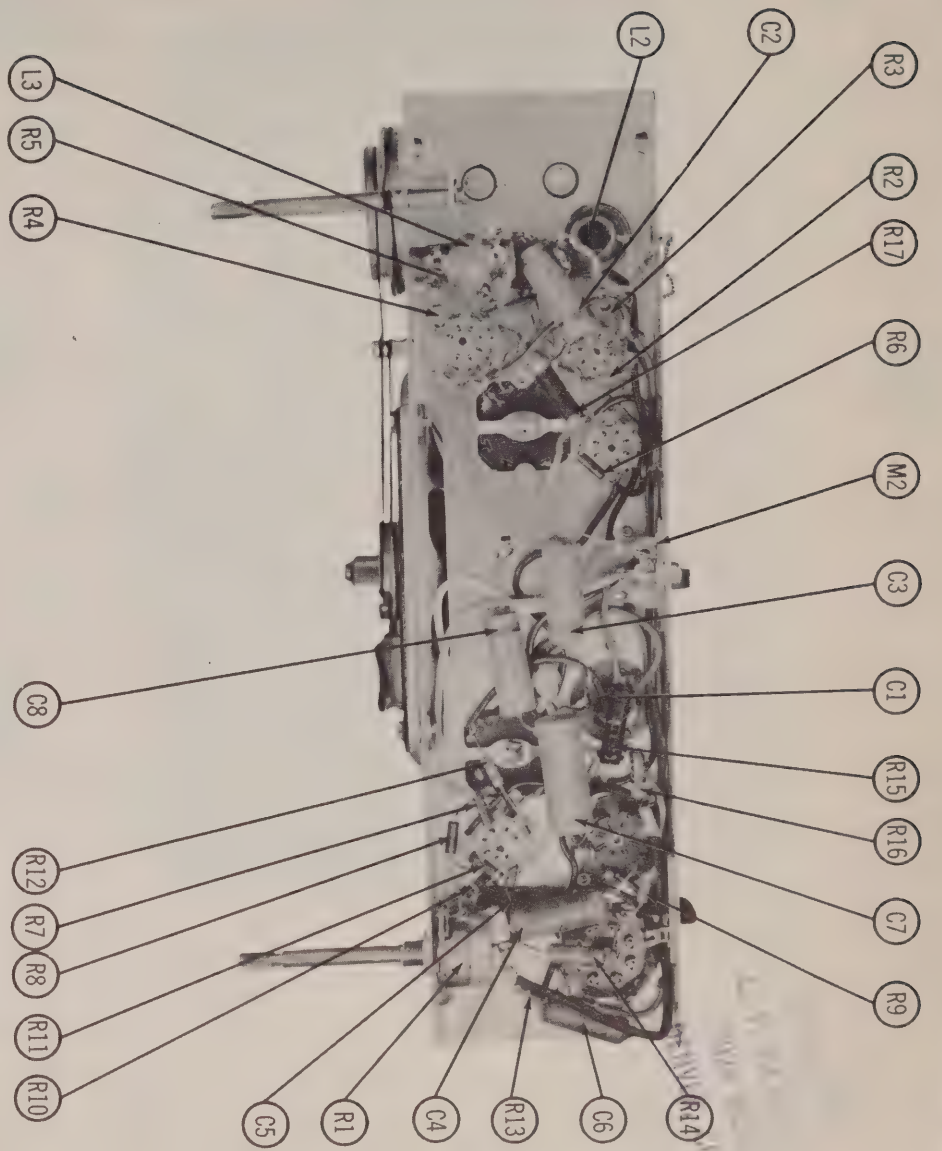
MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
M2	Switch	85-495	Radio-Phono
M3	Tuning Cap	22-2152	18-348MMF, 16-228MMF, 17-152MMF
	Knob	46-745	Walnut Model
	Knob	46-745Y	White & Black Model
	Knob	46-938	Green Model
	Knob	46-939	Grey Model
	Dial Pointer	59-252	Walnut Model Only
	Dial Pointer	59-253	
	Cabinet	14-1274	Walnut Plastic
	Cabinet	14-1275	White Plastic
	Cabinet	14-1276	Black Plastic
	Cabinet	14-1422	Green Plastic
	Cabinet	14-1423	Grey Plastic



DIAL CORD DRIVE

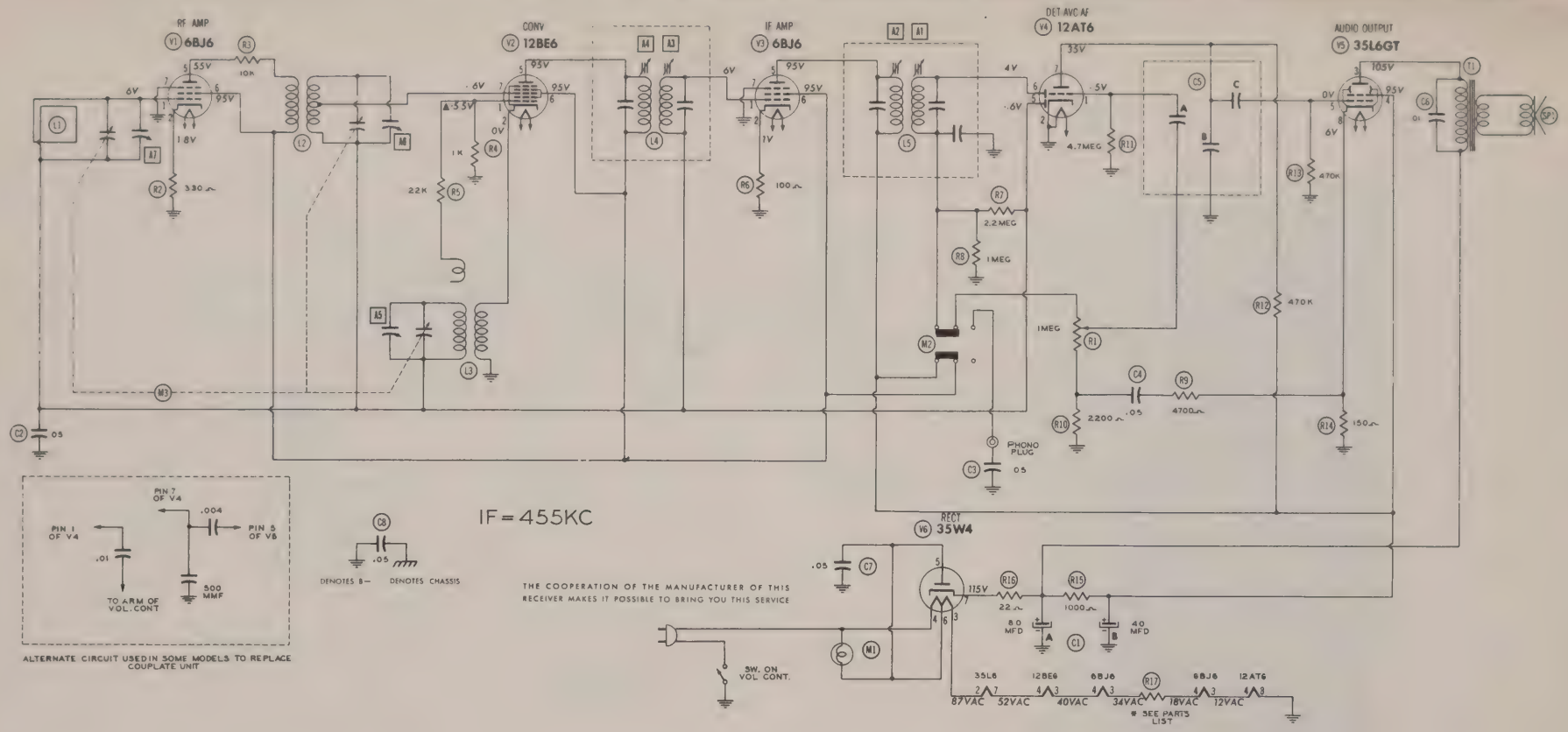
CHASSIS—BOTTOM VIEW



SET 178 FOLDER 16

ZENITH
MODEL H615Z1 (Ch. 6G05Z1)

ZENITH
MODEL H615Z1 (Ch. 6G05Z1)



RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V 1	6BJ6	2.7Meg.	330Ω	118Ω	124	†11KΩ	†1KΩ	0Ω	
V 2	12BE6	22KΩ	16Ω	124Ω	136Ω	†1KΩ	†1KΩ	2.7Meg.	
V 3	6BJ6	2.7Meg.	100Ω	12Ω	18Ω	†1KΩ	†1KΩ	0Ω	
V 4	12AT6	4.7Meg.	0Ω	0Ω	12Ω	2.7Meg.	500KΩ	†470KΩ	
V 5	35L6GT	INF	171Ω	†287Ω	†1KΩ	47DKΩ	†27Ω	136Ω	150Ω
V 6	35W4	4.8KΩ	INF	171Ω	206Ω	188Ω	188Ω	65KΩ	

† MEASURED FROM PIN 7 OF V6.
▲ TAKEN WITH VACUUM TUBE VOLTMETER.

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178-16

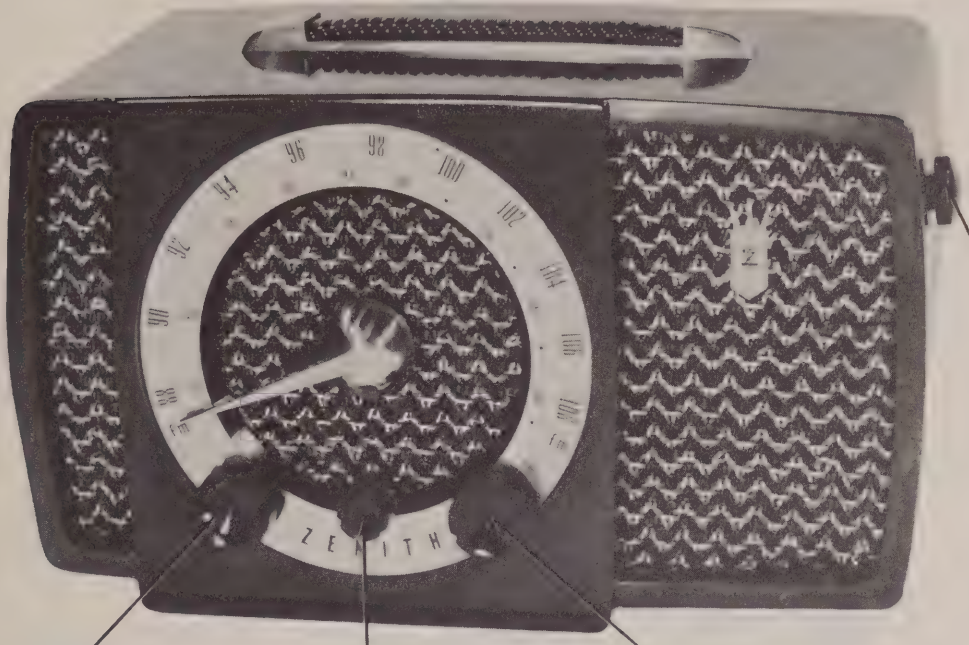
1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

PHOTOFACT* Folder

ZENITH MODELS
H723Z2 (Ch. 7H04Z2), H724Z2 (Ch. 7H02Z2)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ZENITH MODELS
H723Z2 (Ch. 7H04Z2), H724Z2 (Ch. 7H02Z2)



ZENITH MODELS
H723Z2 (Ch. 7H04Z2), H724Z2 (Ch. 7H02Z2)

ZENITH MODEL H724Z2

TRADE NAME	Zenith Models H723Z2 (Ch. 7H04Z2), H724Z2 (Ch. 7H02Z2)		
MANUFACTURER	Zenith Radio Corp., 6001 Dickens Ave., Chicago, Ill.		
TYPE SET	AC-DC Operated AM-FM Superheterodyne Receiver		
TUBES (SEVEN)	Types 6BJ6 FM RF Amp., 12AT7 AM-FM Conv., 6BJ6 1st. FM-AM IF Amp., 12BA6 2nd. FM-AM IF Amp., 12AU6 FM Limiter, 19T8 (or) 19C8 Disc.-Det.-AVC-AF Amp. 35C5 Audio Output.		
POWER SUPPLY	110-120 Volts AC/DC	RATING	.30 Amp. @ 117 Volts AC
TUNING RANGE -BROADCAST	540-1620KC	FREQ. MOD.	88-108 MC

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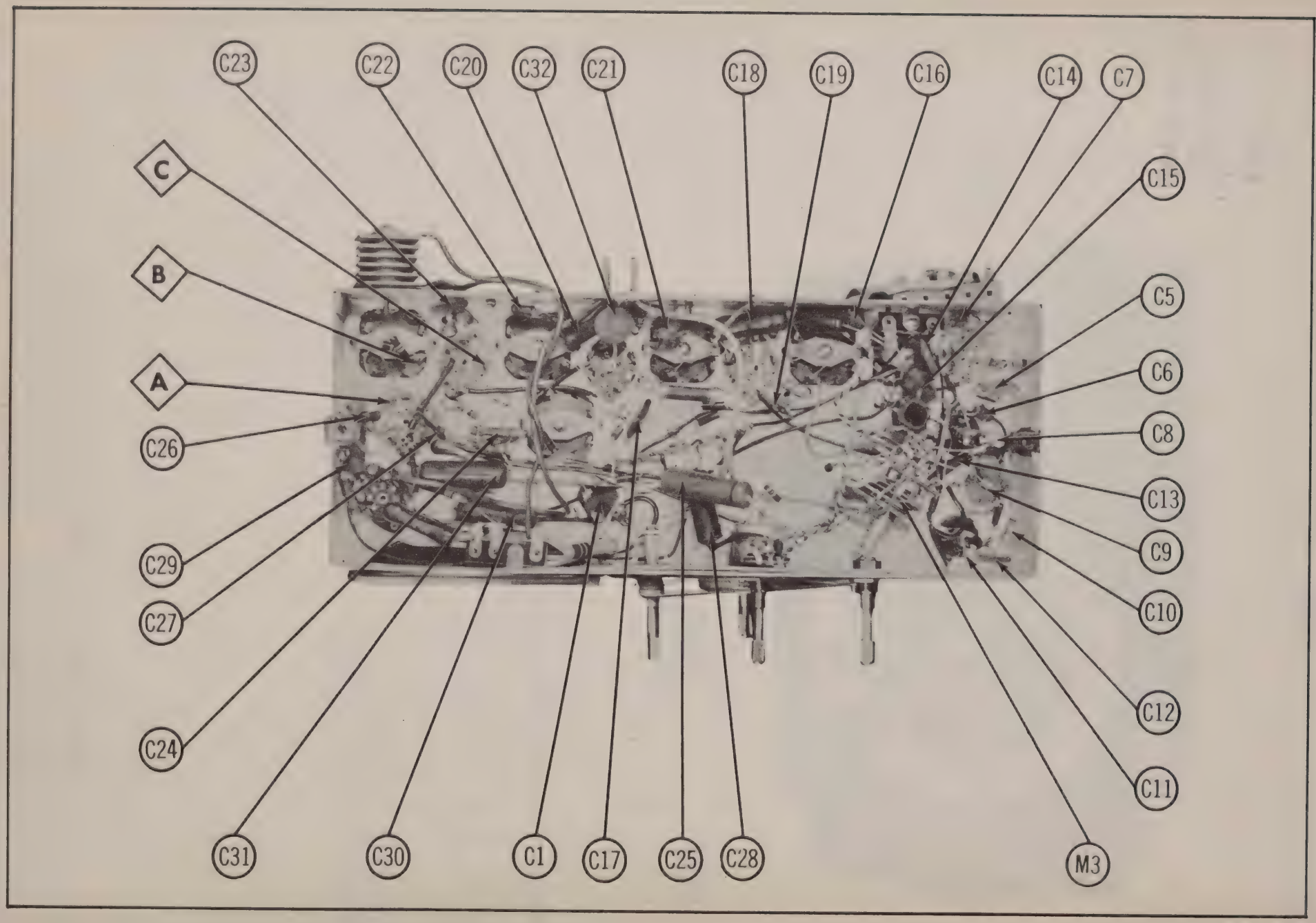
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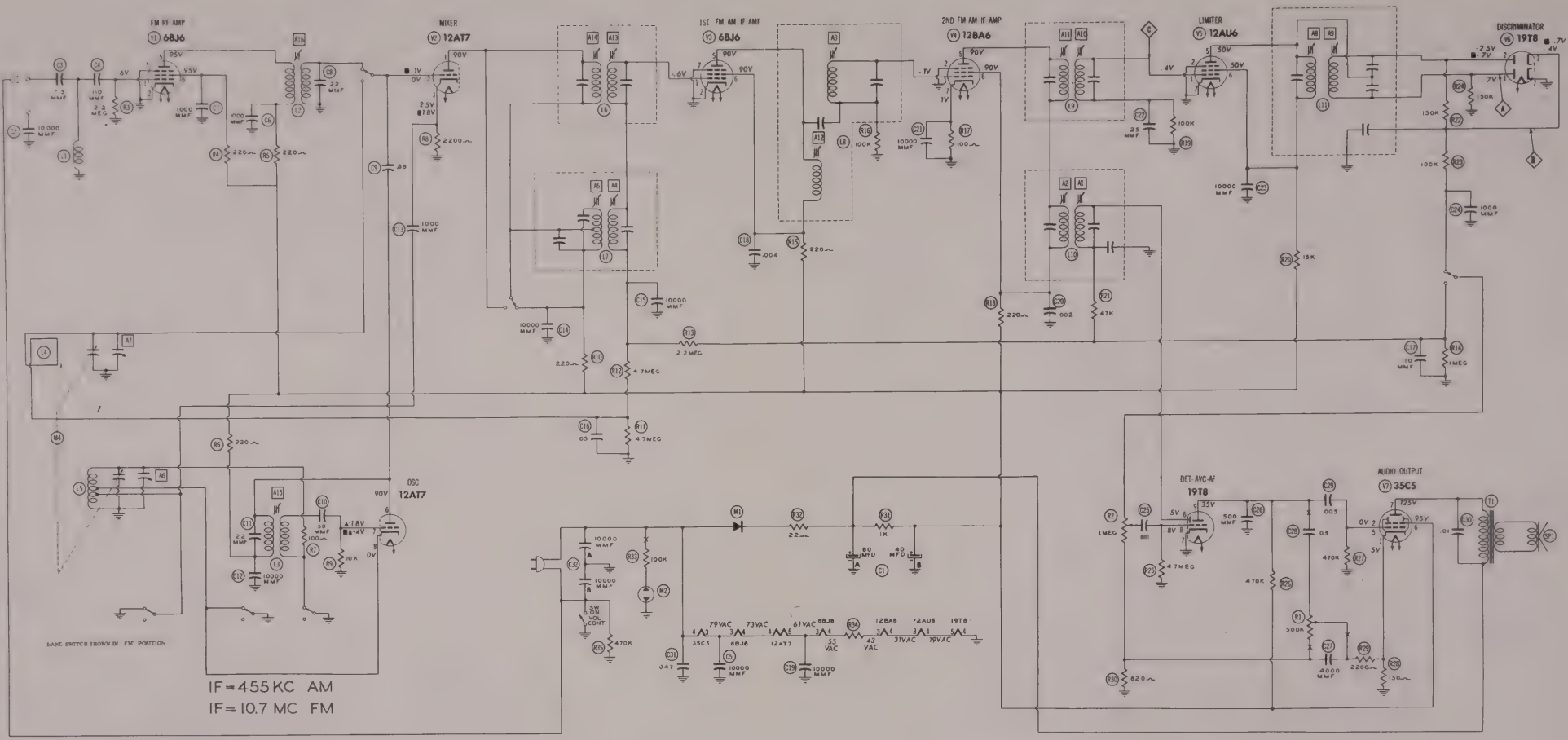

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V 1	6BJ6	2.2Meg.	0Ω	167Ω	161Ω	†1.2KΩ	†1.2KΩ	0Ω		
V 2	12AT7	†1.2KΩ	0Ω ■2.5Meg.	2.2KΩ	161Ω	149Ω	†1.2KΩ	10KΩ	0Ω ■2.8Ω	155Ω
V 3	6BJ6	2.5Meg. ■2.3Meg.	0Ω	149Ω	143Ω	†1.2KΩ	†1.2KΩ	0Ω		
V 4	12BA6	100KΩ	0Ω	43Ω	31Ω	†1.2KΩ	†1.2KΩ	100Ω		
V 5	12AU6	100KΩ	0Ω	31Ω	19Ω	†16KΩ	†16KΩ	0Ω		
V 6	19T8	140KΩ ■150KΩ	135KΩ ■150KΩ	240KΩ ■300KΩ	0Ω	19Ω	1 Meg. ■550KΩ	0Ω	4.7Meg.	†470KΩ
V 7	35C5	150Ω	470KΩ	167Ω	202Ω	470KΩ	†1KΩ	†282Ω		

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS NOTED.
† MEASURED FROM OUTPUT OF M1
■ MEASURED IN "AM" POSITION

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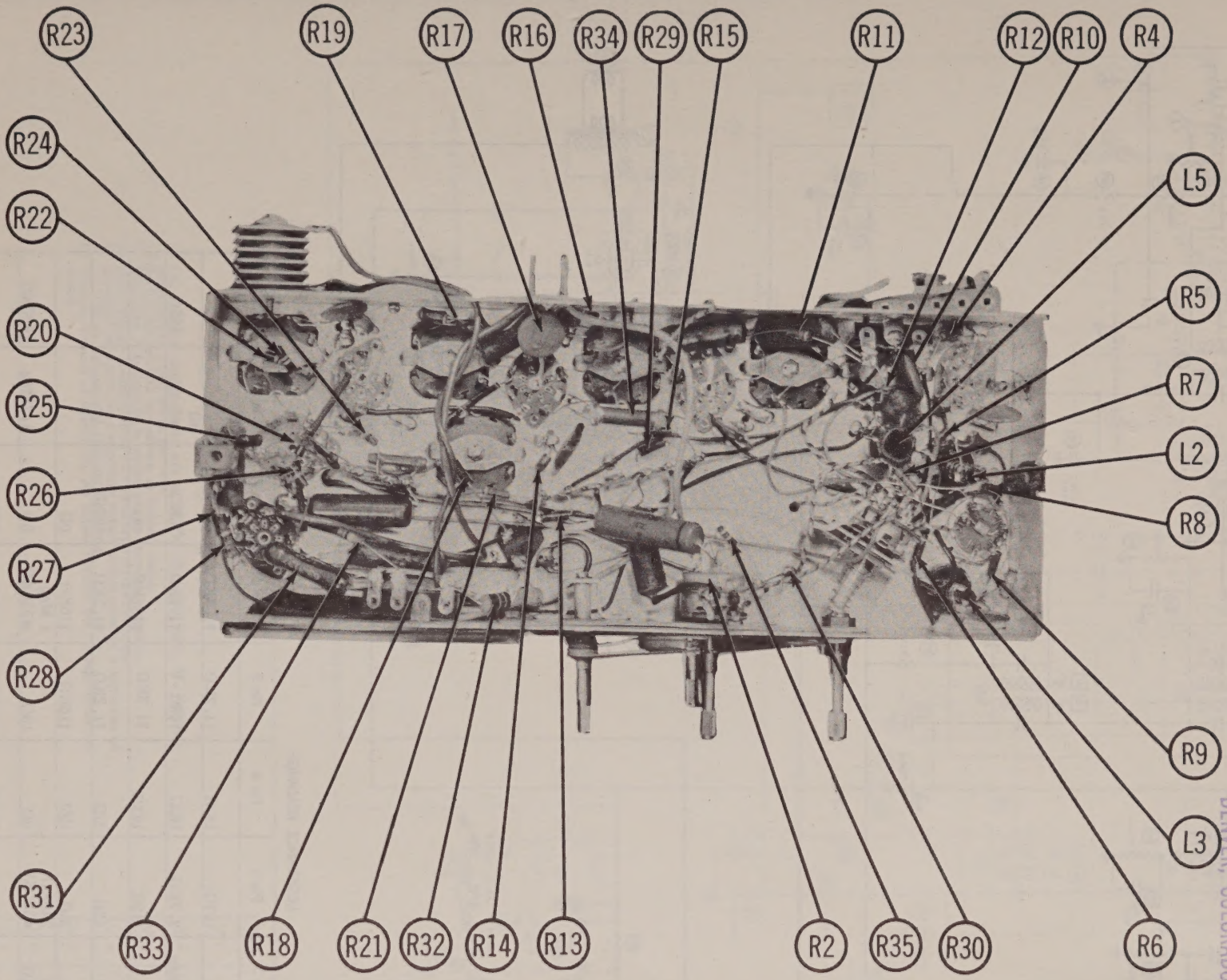


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available, If not, connect a .1MFD capacitor in series with low side of signal generator and chassis. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

Loop should be maintained in same relative position to chassis as when receiver is in cabinet.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05MFD	High side to pin 7 (grid) of 12AT7 (V2) Low side to chassis	455KC (400~Mod)	AM	600KC	Across voice coil.	A1, A2 A3, A4	Adjust for maximum output. If isolation transformer is not used, reduce dummy antenna to .001Mfd. to reduce hum modulation
2.		Loop	1620KC	"	Tuning gang fully open.	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	"	Tune to 1400KC signal.	"	A7	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR AND VTVM

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
4.	.05MFD	High side to pin 1 (grid) of 12AU6 (V5) Low side to chassis.	10.7MC (Unmod.)	FM	Any point of non-interference ence.	DC probe to point (A) Common to chassis.	A8	Adjust for maximum deflection.
5.	"	"	"	"	"	DC probe to point (B) Common to chassis.	A9	Adjust for mimimum deflection.
6.	"	High side to pin 1 (grid) of 6BJ6 (V3) Low side to chassis.	"	"	"	DC probe to point (A) Common to chassis.	A10, A11 A12	Adjust for maximum deflection.
7.	"	High side to pin 2 (grid) of 12AT7 (V2)	"	"	"	"	A13, A14	"

FM IF ALIGNMENT USING FM SIGNAL GENERATOR AND OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.
During alignment alternate generator to minimum usable output.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	SCOPE CONNECT	ADJUST	REMARKS
4.	.05MFD	High side to pin 1 (grid) of 12AU6 (V5) Low side to chassis.	10.7MC (450KC Swp)	FM	Any point of non-interference	Vert amp. to point (A) Low side to chassis.	A8	Adjust for curve of maximum amplitude and symmetry as per fig. 1.
5.	"	"	"	"	"	Vert amp. to point (B) Low side to chassis.	A9	Adjust so that 10.7MC occurs at center of crossover lines as per fig. 2. SLIGHTLY retouch A8 for maximum amplitude and straightness of crossover lines.
6.	"	High side to pin 1 (grid) of 6BJ6 (V3) Low side to chassis.	"	"	"	Vert amp. to point (A) Low side to chassis.	A10, A11 A12,	Adjust for curve of maximum amplitude and symmetry as per fig. 1.
7.	"	High side to pin 2 (grid) of 12AT7 (V2) Low side to chassis.	"	"	"	"	A13, A14	"

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	270Ω Carbon resistor	Across FM antenna terminals with 270Ω in one lead.	98MC (Unmod.)	FM	98MC	DC probe to point (A) Common to chassis.	A15, A16	Adjust in order named for maximum deflection.

Replace set in cabinet, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.

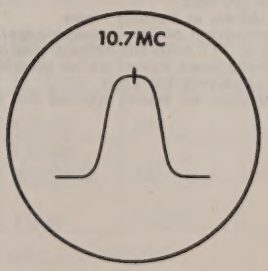


FIG. 1

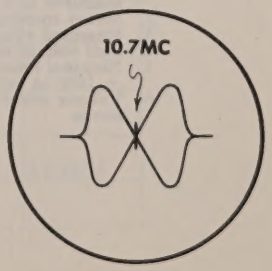


FIG. 2

PARTS LIST AND DESCRIPTIONS

TUBES (SYLVANIA or Equivalent)

ITEM No.	USE	REPLACEMENT DATA: ZENITH PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	NOTES
V1	FM RF Amplifier	6BJ6	6BJ6	7CM	
V2	Converter	12AT7	12AT7	9A	
V3	1st. FM AM IF Amp	6BJ6	6BJ6	7CM	
V4	2nd. FM AM IF Amp	12BA6	12BA6	7BK	
V5	Limiter	12AU6	12AU6	7BK	
V6A	Discr. - Detector - AVC-AF Amplifier	19T8	19T8	9E	
V6B	Discr. - Detector - AVC-AF Amplifier	19C8	19C8	9E	V6A-V6B are directly interchangable.
V7	Audio Output	35C5	35C5	7CV	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA: ZENITH PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C1A	■80	150	22-1757	AFH3-10		UP8415		FP216	TVL-3440	
B	▲40	150								
C2	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C3	7.5		22-1852							
C4	110		22-5	SI110						
C5	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C6	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C7	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C8	22		22-1506	SI22N080			N080-331-220			
C9	.68		22-1766		TCZ-.68		NP0K-R68			
C10	50		22-1367				N330L-500			
C11	22		22-1506	SI22N080			N080-331-220			
C12	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C13	1000		22-1676	SI1000	D6-102	TM5D1	GP2L-102	UC-521	5HK-D1	
C14	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C15	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C16	.05	200	22-829	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C17	110		22-5	SI110						
C18	.004	600	22-448	P688-004	D6-402	PTE6D4	GP2-333-402	PT624	6TM-D4	
C19	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C20	.002	600	22-1220	P688-002	D6-202	PTE6D2	GP2-333-202	PT622	6TM-D2	
C21	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-521	5HK-S1	
C22	25		22-1887	SI25	D6-250		GP1K-250	UC-5425	5GA-Q25	
C23	10000		22-3	BPD-01	DD-103	TM5S1	821-01	DC-511	5HK-S1	
C24	1000		22-2112							
C25	.02	600	22-830	P688-02	DF-203	PTE6S2		PT612	6TM-S2	
C26	500			SI500	D6-501	TM5T5	GP2K-501	UC-535	5GA-T5	Note 1
C27	4000		22-4	BPD-004	D6-402	TM5D4	GP2-333-402	DC-524	5HK-D4	Note 2
C28	.05	200	22-1158	P288-05	DF-503	PJ2S5		PT415	2TM-S5	
C29	.005	600	22-229	P688-005	D6-502	PTE6D5	GP2-333-502	PT625	6TM-D5	
C30	.01	400	22-1126	P488-01	D6-103	PTE4S1	GP2-333-103	PT411	4TM-S1	
C31	.047	400	22-1775	P488-047		PTE4S47		PT4147	4TM-S47	
C32A	10000		22-2276	BPD-01	DD-3-103	TM5DS1	821-01	DC-511	5HK-2S1	
B	10000									

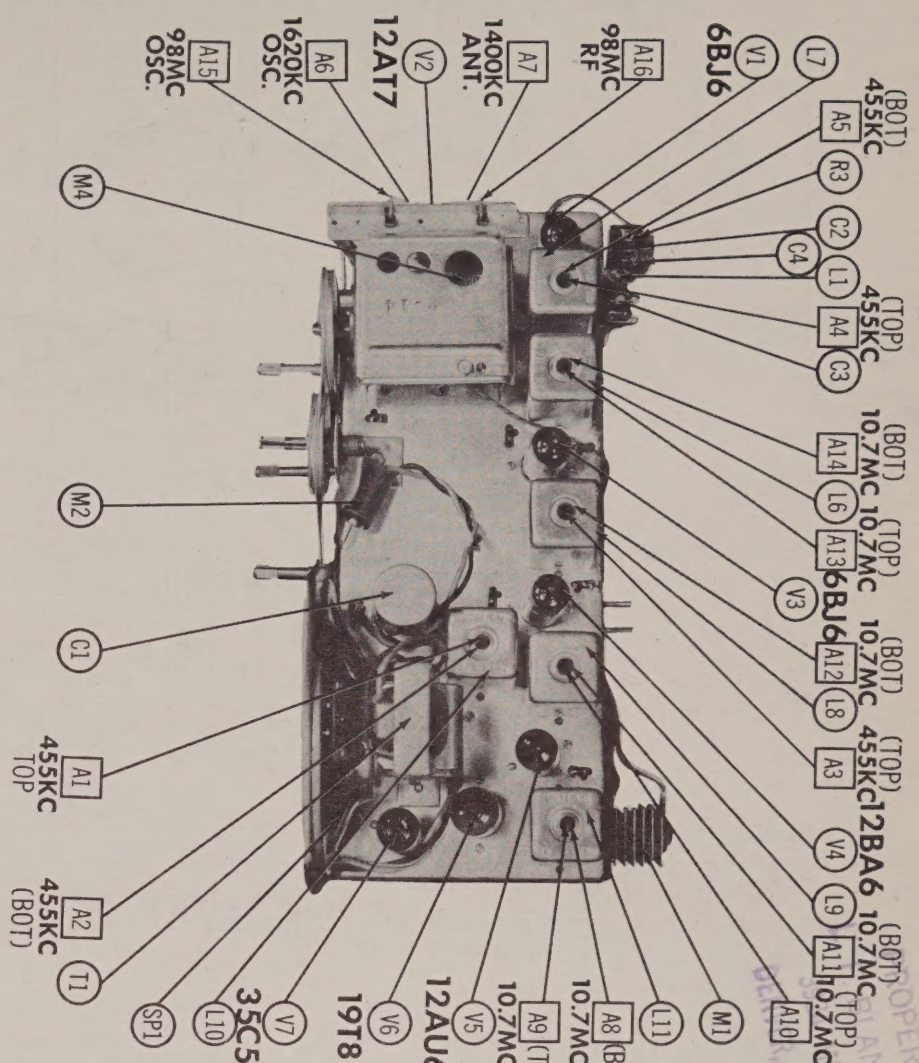
Note 1. Some models use 470MM F in this application (Part #22-6).
Note 2. Not used in Chassis 7H04Z2

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA: ZENITH PART No.	IRC PART No.	CLAROSTAT PART No.	CENTRALAB PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500KΩ	1/2	63-2144	Q11-133	AG-58-S	AB-59	SU-50	Tone-Note
B	Shaft		Not Req.	Not Req.	FKS-1/4	AK-1	Not Req.	Attach to R1A
R2A	1 Meg.	1/2	63-2143	Q13-137	AG-63-Z	BSK-70-S	U-53	Volume
B	Shaft		Not Req.	Not Req.	KSS-3	Not Req.	Not Req.	Attach to R2A
C	Switch		Not Req.	76-1	SWB	Not Req.	US-26	Attach to R2A

Note: Used only in model No. H724Z2.

CHASSIS—TOP VIEW



COPERI... SKANKENSHIP ... BLANKENSHIP ... DENVER, COLORADO.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING OHMS	RATING WATTS	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA IRC PART No.	NOTES
R3	2.2Meg.	½	63-1926	BTS-2.2Meg.	
R4	220Ω	½	63-1758	BTS-220	
R5	220Ω	½	63-1758	BTS-220	
R6	220Ω	½	63-1758	BTS-220	
R7	100Ω	½	63-1744		
R8	2200Ω	½	63-1800	BTS-2200	
R9	10KΩ	½	63-1828	BTS-10K	
R10	220Ω	½	63-1758	BTS-220	
R11	4.7Meg.	½	63-1940	BTS-4.7Meg.	
R12	4.7Meg.	½	63-1940	BTS-4.7Meg.	
R13	2.2Meg.	½	63-1926	BTS-2.2Meg.	
R14	1 Meg.	½	63-1912	BTS-1 Meg.	
R15	220Ω	½	63-1758	BTS-220	
R16	100KΩ	½	63-1870	BTS-100K	
R17	100Ω	½	63-1744	BTS-100	
R18	220Ω	½	63-1758	BTS-220	
R19	100KΩ	½	63-1870	BTS-100K	
R20	15KΩ	½	63-1835	BTS-15K	
R21	47KΩ	½	63-1856	BTS-47K	
R22	150KΩ	½	63-1876	BTS-150K	
R23	100KΩ	½	63-1870	BTS-100K	
R24	150KΩ	½	63-1876	BTS-150K	
R25	4.7Meg.	½	63-1940	BTS-4.7Meg.	
R26	470KΩ	½	63-1898	BTS-470K	
R27	470KΩ	½	63-1898	BTS-470K	
R28	150KΩ	½	63-686	BTS-150	
R29	2200Ω	½	63-1800	BTS-2200	
R30	820Ω	½	63-1782	BTS820	
R31	1000Ω	5	63-3137	1 3/4 A-1000	
R32	22Ω	1	63-1450		
R33	100KΩ	½	63-1870	BTS-100K	
R34	*	*	63-2797		
R35	470KΩ	½	63-1898	BTS-470K	

* Special temperature conpensating resistor (100ΩHot, 750ΩCold)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA MERIT PART No.	REPLACEMENT DATA CHICAGO PART No.	REPLACEMENT DATA TRIAD PART No.	NOTES
T1	3KΩ	3.9Ω	260Ω	.5Ω	206-689 TS-2035 ② 206-707 ②	A-3332①	A-3019 ①	R0-2 ①	S-4X ①	① Bend mtg. tabs down, file out slots mount on original mounting bracket. ② Alternate Audio output transformer.

SPEAKER

ITEM No.	RATINGS SIZE	RATINGS FIELD	RATINGS V. C. IMP.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA JENSEN PART No.	REPLACEMENT DATA QUAM PART No.	NOTES
SP1	5 1/4"	PM	3.9Ω	49-689 49-707 ①		52A1	① Alternate 5 1/4 PM Speaker.

COILS (RF-IF)

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA MERIT PART No.	NOTES
L1	FM Ant. Coil	0Ω		20-355		
L2	FM RF Coil	0Ω	0Ω	S-13871		
L3	FM Osc. Coil	0Ω	0Ω	S-15733		
L4	AM Loop Ant.	1.4Ω		S-14957		
L5	AM Osc. Coil	6.3Ω		S-15694		Tapped at 2.8Ω & at .8Ω
L6	1st. FM IF	.5Ω	.5Ω	95-1150	FM-251	
L7	1st. AM IF	9.2Ω	16Ω	95-1250		Tapped at 4.6Ω
L8	2nd. FM AM IF	1.6Ω	25Ω	95-1251		
L9	3rd. FM IF	.4Ω	.4Ω	95-1150	FM-251	
L10	3rd. AM IF	19Ω	19Ω	95-1102		
L11	Discrim.	.3Ω	.4Ω	95-1153	FM-250	

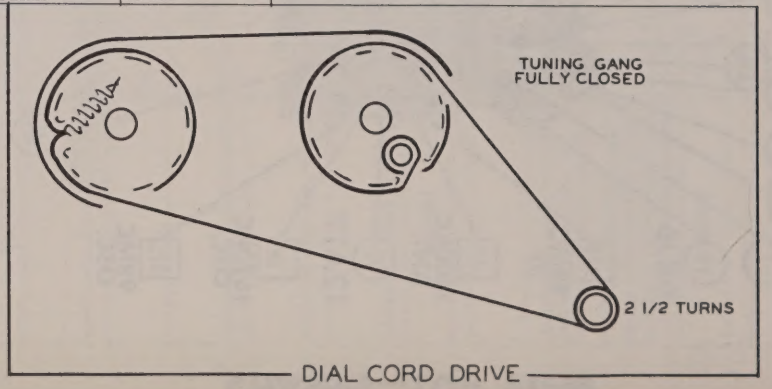
PARTS LIST AND DESCRIPTIONS (Continued)

SELENIUM RECTIFIER

ITEM No.	RATING CURRENT	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA SYLVANIA PART No.	REPLACEMENT DATA SELETRON PART No.	REPLACEMENT DATA FEDERAL PART No.	REPLACEMENT DATA MALLORY PART No.	NOTES
M1	.080A	212-13 212-7 ①	NC5	5M1	1101A	6S100A	① Alternate Rectifier

DIAL LIGHTS

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ZENITH PART No.	REPLACEMENT DATA	NOTES
M2				White	100-105		Type No. #NE51

MISCELLANEOUS

ITEM No.	PART NAME	ZENITH PART No.	NOTES
M3	Switch	85-516	AM-FM
M4	2 Gang. Var. Cap.	22-1742	(31-466MMF, 27-208MMF)
	Cabinet	14-1350	Model H723Z2
	Cabinet	14-1273	Maroon }
	Cabinet	14-1398	Grey } Model H724Z2
	Cabinet	14-1399	Breen }
	Knob	46-859	Bandswitch }
	Knob	46-860	Tuning } Model H723Z2 &
	Knbb	46-900	Volume } model H724Z2 (Maroon)
	Knbo	46-901	Tone-Model H724Z2 (Maroon)
	Knob	46-962	Bandswitch }
	Knob	46-963	Tuning } Model H724Z2 (Grey)
	Knob	46-964	Vokume }
	Knob	46-965	Tone }
	Knob	46-966	Bandswitch }
	Knob	46-967	Tuning }
	Knob	46-968	Volume } Model H724Z2 (Green)
	Knob	46-969	Tone }
	Dial Pointer	59-251	
	Dial Scale	26-463